Major Stormwater Management Plan
(Major SWMP)
For
Top of the Pine

TPM 20951

Preparation/Revision Date:
May 23, 2011
~~February 1, 2011~~

Prepared for:
One PAC Company
2727 N. Central Avenue
Phoenix, CA 91935

Prepared by:
Fitzmaurice Consulting-Civil Engineering
1666 Garnet Avenue, Suite 410
San Diego, CA 92109
(858) 483-3634

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the following Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

Thomas Fitzmaurice, RCE #55553

5-23-11
Date

The Major Stormwater Management Plan (Major SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Major or Minor SWMP, please reference the County's Stormwater Intake Form for Development Projects.

Project Name:	TOP OF THE PINE
Project Location:	PINE VALLEY ROC I-8
Permit Number (Land Development Projects):	TPM 20951
Work Authorization Number (**CIP only**):	
Applicant:	FCCE
Applicant's Address:	1666 GARNET AVE #410
Plan Prepared By (*Leave blank if same as applicant*):	THOMAS FITZMAURICE
Preparer's Address:	"SAME"
Date:	

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9926) requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806 b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Stages	Does the SWMP need revisions?		If YES, Provide Revision Date	County Reviewer
	YES	NO		

Instructions for a Major SWMP can be downloaded at
http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html

Completion of the following checklists and attachments will fulfill the requirements of a Major SWMP for the project listed above.

STEP 1

PRIORITY DEVELOPMENT PROJECT DETERMINATION

TABLE 1: IS THE PROJECT IN ANY OF THESE CATEGORIES?

Yes ☐	No ☒	A	Housing subdivisions of 10 or more dwelling units. Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes ☐	No ☒	B	Commercial—greater than one acre. Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes ☐	No ☒	C	Heavy industry—greater than one acre. Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes ☐	No ☒	D	Automotive repair shops. A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes ☐	No ☒	E	Restaurants. Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes ☒	No ☐	F	Hillside development greater than 5,000 square feet. Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes ☐	No ☒	G	Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes ☐	No ☒	H	Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes ☒	No ☐	I	Street, roads, highways, and freeways. Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ☐	No ☒	J	Retail Gasoline Outlets (RGOs) that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through K. If any of the definitions match, the project is a Priority Development Project. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development. Please see special requirements for previously developed sites and project exemptions on page 6 of the County SUSMP.

STEP 2

PROJECT STORMWATER QUALITY DETERMINATION

Total Project Site Area 18.26 (Acres or ft²)

Estimated amount of disturbed area: 3.35 (Acres or ft²)
(If >1 acre, you must also provide a WDID number from the SWRCB) WDID: _____

Complete A through C and the calculations below to determine the amount of impervious surface on your project before and after construction.

A. Total size of project site: 18.26 (Acres or ft²)

B. Total impervious area (including roof tops) before construction 0.32 (Acres or ft²)

C. Total impervious area (including roof tops) after construction 1.29 (Acres or ft²)

Calculate percent impervious before construction: B/A = 1.8 %
Calculate percent impervious after construction: C/A = 7.0 %

Please provide detailed descriptions regarding the following questions:

TABLE 2: PROJECT SPECIFIC STORMWATER ANALYSIS

1. Please provide a brief description of the project.
The Top of the Pine Development is an 18.97-acre development that will subdivide one lot into 4 lots and will include a new private access road, graded driveways, house pads, septic systems and water services from an existing onsite well. The site is located just north of Interstate 8 and west Pine Valley Road in Pine Valley California. The site is on top of a hill that slopes down in all four directions. To the south is Caltrans right-of-way and to the east is County maintained Pine Valley Road. North and West of the project are undeveloped lands in the Cleveland National Forest. Existing improvements onsite include a paved private road within an access easement entitled Top of the Pines Lane, which crosses the northeast corner of the site from Pine Valley Road to the north side of the property. An unpaved gravel access road branches off Top of the Pines Lane and winds up the hill west then runs south along the western property line and continues off site. Drainage improvements on site include a 36" CMP drain culvert that crosses under Top of the Pine Lane about 150-feet west of Pine Valley Road and a second 36" CMP drain culvert crosses under Pine Valley Road near the southeast corner of the property. Two active groundwater water wells are located on the property, both on proposed parcel 1, and will remain in use. There are no dry weather flows from the project site. The proposed development includes four new lots with estate size pads, an 810-foot of 24-foot wide paved access road, 640-feet of 16-foot wide paved driveways, a paved cul-de-sac, septic leach fields for each lot, water services from the water wells, and fire department turn-arounds where required. Project will include extensive grading and drainage improvements, on site and also permanent BMPs along with numerous erosion control BMP measures. Hydromodification calculations are provided for the site improvements. Houses were assumed on each graded pad for bioretention sizing.
2. Describe the current and proposed zoning and land use designation.
Zone: RR.25, 4.0 AC lot size General Plan: GP1 General Plan Regional: 1/CT Community Plan Area: Central Mountain
3. Describe the pre-project and post-project topography of the project. (Show on Plan)
The existing topography of the project is mountainous with two peaks on the western side of the lot and two natural drainage channels that flow to the north and east. The slopes of the hillsides vary with and average of 12% and a grade differential of 154 feet from a high of 3929 feet at the peak to a low of 3775 feet at the east outflow. The site is mostly undisturbed natural terrain with an improved private road crossing the northeast corner and a gravel access road crossing from east to west. The previously disturbed area on the north side was part of an avocado grove in the past. The entire site slopes towards the south at varying rates and is as steep at 50 percent. The project will create four large graded pads in the flatter areas on site, private road and new driveways. The existing dirt access road will be removed and restored with native vegetation.
4. Describe the soil classification, permeability, erodibility, and depth to groundwater for

LID and Treatment BMP consideration. (Show on Plan) If infiltration BMPs are proposed, a Geotechnical Engineer must certify infiltration BMPs in Attachment E.
The existing soil in this area has been classified as Soil Group B, and infiltration rates are medium to high. No soils investigation has been prepared for project at this time. Two water wells area located on the property and ground water table elevations are available, however no deep excavations are proposed with this development and no ground water should be encountered.
5. Describe if contaminated or hazardous soils are within the project area. (Show on Plan)
No record of contaminated or hazardous soils on this property. A more formal investigation will be complete in the development portion of this project.
6. Describe the existing site drainage and natural hydrologic features. (Show on Plan).
The Top of the Pines Development is located in Tijuana Watershed, Hydrologic Unit No. 911, and Hydrologic Subarea No. 911.41, Barrett Lake and Pine Valley Creek. The site is located on top of a hill with rolling terrain, granite outcroppings and natural drainage channels. No dwelling units exist on the property, just a portion of paved road and non-standard gravel road. Storm water runoff flows down in primarily two directions, to the north and east, with a small portion flowing to the west. Runoff to the east flows parallel to the existing gravel access road in a natural channel towards Pine Valley Road then crosses under the road in a 36" CMP culvert. Runoff to the north sheet flows across the western portion of the north property line. Both of these flows continue through the rural area and eventually join together and head southwest towards Barrett Lake. The basin that flows to the east and under Pine Valley Road, Basin A, is 12.69-acres and 1,335-feet long. It generates a 10-year storm flow of 15.7 cfs and a water quality flow of 0.81 cfs. The second basin, Basin B, flow to the north and is 5.85-acres in size, 680-feet long and generates a 10-year flow of 8.60 cfs and a water quality flow of 0.37 cfs. The new development will increase the runoff during a 10-year storm event by 4.2 cfs in Basin A, and 2.4 cfs in Basin B. See drainage calculations and rainfall intensity curves in Attachment H, Addendum. The general climate in the hills east of San Diego is seasonal with light snow fall in the winter and hot temperatures in the summer. The estimated annual rainfall for this area is between 15"-20". There are no dry weather flows though the site and no 303(d) impaired receiving water bodies downstream of the site. Two existing water wells will be utilized with this development project. The wells have been tested and evaluated and a copy of the report can be provided upon request. The soil classification for the area is Soil Group B.
The storm water runoff for 100-year storms were calculated using the Rational Method as outlined in the County of San Diego Hydrology Manual dated June 2003. The watershed soil group for the basin is categorized under Soil Group C, which has medium low infiltration rates. The precipitation in the area was 3.0-inches for a 6-hr, 100-year storm, and the Intensity were calculated to be 4.74 inches/hour.
7. Describe site features and conditions that constrain, or provide opportunities for storm water control, such as LID features.
The existing terrain of the project is mountainous land with 400' of paved private road and 1000 feet of un-paved access road. The development will not alter any of the drainage flows. The proposed access road has been design to minimize grading and minimize impact on the natural drainage flows. The road will follow the grades and provide bioretention areas off the road where runoff will join the existing natural drainage channels. The bioretention areas have been designed

to handle the volume of runoff flow from an 85th % storm event in accordance with the hydromodification BMP calculator. For the hydromodification calculator, the graded pads will include a 2,000 square foot home with driveway. All of the roads and driveways will be built at the narrowest width to minimize the disturbed and impervious surface areas. The volume of storm water runoff retained in bioretention areas will keep runoff rates from the entire site to predevelopment levels. Please see Attachment C, Drainage Management Areas Exhibit.
8. Is this project within the environmentally sensitive areas as defined on the maps in Appendix A of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects?*
Yes No X
9. Is this an emergency project?
Yes No X

CHANNELS & DRAINAGES

Complete the following checklist to determine if the project includes work in channels.

TABLE 3: CHANNEL& DRAINAGE ANALYSIS

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project include work in channels?		✓		If YES go to 2 If NO go to 13.
2.	Will the project increase velocity or volume of downstream flow?				If YES go to 6.
3.	Will the project discharge to unlined channels?				If YES go to. 6.
4.	Will the project increase potential sediment load of downstream flow?				If YES go to 6.
5.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?				If YES go to 8.
6.	Review channel lining materials and design for stream bank erosion.				Continue to 7.
7.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.				Continue to 8.
8.	Include, where appropriate, energy dissipation devices at culverts.				Continue to 9.
9.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.				Continue to 10.
10.	Include, if appropriate, detention facilities to reduce peak discharges.				Continue to 11.
11.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.				Continue to 12.
12.	Provide other design principles that are comparable and equally effective.				Continue to 13.
13.	End		✓		

TEMPORARY CONSTRUCTION BMPS

Please check the construction BMPs that may be implemented during construction of the project. The applicant will be responsible for the placement and maintenance of the BMPs incorporated into the final project design.

- [x] Silt Fence
- [ ] Fiber Rolls
- [x] Street Sweeping and Vacuuming
- [ ] Storm Drain Inlet Protection
- [x] Stockpile Management
- [x] Solid Waste Management
- [x] Stabilized Construction Entrance/Exit
- [ ] Dewatering Operations
- [ ] Vehicle and Equipment Maintenance
- [ ] Desilting Basin
- [ ] Gravel Bag Berm
- [x] Sandbag Barrier
- [x] Material Delivery and Storage
- [x] Spill Prevention and Control
- [x] Concrete Waste Management
- [x] Water Conservation Practices
- [x] Paving and Grinding Operations

- [ ] Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an "exceptional threat to water quality," and therefore require Advanced Treatment Best Management Practices during the construction phase.

TABLE 4: EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf		✓	If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?			If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?			If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors k_f greater than or equal to 0.4?			If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.	✓		Document for Project Files by referencing this checklist.
6.	Project poses an "exceptional threat to water quality" and is required to use Advanced Treatment BMPs.		✓	Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria

Exemption potentially available for projects that require advanced treatment: Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that demonstrates (to the County official's satisfaction) that advanced treatment is not required.

STEP 3

HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management plan (HMP) issues. If the project is exempt from the HMP criteria, please provide the supporting documentation in Attachment H. Please reference the full descriptions of the HMP exemptions located in Figure 1-1 of the County SUSMP.

TABLE 5: HYDROMODIFICATION DETERMINATION

	QUESTIONS	YES	NO	Information
1.	Will the project reduce the pre-project impervious area and are the unmitigated post-project outflows (outflows without detention routing) to each outlet location less as compared to the pre-project condition?	✓		If NO, continue to 2. If YES, go to 7.
2.	Would the project site discharge runoff directly to an exempt receiving water, such as the Pacific Ocean, San Diego Bay, an exempt reservoir, or a tidally-influenced area?		✓	If NO, continue to 3. If YES, go to 7.
3.	Would the project site discharge to a stabilized conveyance system, which has the capacity for the ultimate Q_{10}, and extends to the Pacific Ocean, San Diego Bay, a tidally-influenced area, an exempt river reach or reservoir?		✓	If NO, continue to 4. If YES, go to 7.
4.	Does the contributing watershed area to which the project discharges have an impervious area percentage greater than 70 percent?		✓	If NO, continue to 5. If YES, go to 7.
5.	Is this an urban infill project which discharges to an existing hardened or rehabilitated conveyance system that extends beyond the "domain of analysis," where the potential for cumulative impacts in the watershed are low, and the ultimate receiving channel has a "Low" susceptibility to erosion as defined in the SCCWRP channel assessment tool?		✓	If NO, continue to 6. If YES, go to 7.
6.	Project is required to manage hydromodification impacts.	✓		Reference Appendix G "Hydromodification Management Plan" of the County SUSMP.
7.	Project is not required to manage hydromodification impacts.			Hydromodification Exempt. Keep on file.

STEP 4

POLLUTANTS OF CONCERN DETERMINATION

WATERSHED

Please check the watershed(s) for the project.

☐ San Juan 901	☐ Santa Margarita 902	☐ San Luis Rey 903	☐ Carlsbad 904
☐ San Dieguito 905	☐ Penasquitos 906	☐ San Diego 907	☐ Sweetwater 909
☐ Otay 910	☒ Tijuana 911	☐ Whitewater 719*	☐ Clark 720*
☐ West Salton 721*	☐ Anza Borrego 722*	☐ Imperial 723*	

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

*Projects located fully within these watersheds require only a Minor SWMP.

HYDROLOGIC SUB-AREA NAME AND BASIN NUMBER(S)

Basin Number	Sub-Area Name
911.41	PINE VALLEY CREEK, BARRETT LAKE

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

SURFACE WATERS that each project discharge point proposes to discharge to.

SURFACE WATERS (river, creek, stream, etc.)	Hydrologic Unit Basin Number	Impairment(s) listed [303(d) listed waters or waters with established TMDLs]. List the impairments identified in **Table 7**.	Distance to Project
PINE VALLEY CREEK	11.4	ENTEROCOCCUS, NITRATE, OXIGEN PHOSPHOROUS, TDS, TURBIDITY, PH	N/A
BARRETT LAKE	11.30		50 MILES +/-

http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r9_06_303d_reqtmdls.pdf

GROUND WATERS

Ground Waters	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
BARRETT LAKE	11.30	X	X													

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

+ Excepted from Municipal • Existing Beneficial Use ○ Potential Beneficial Use

PROJECT ANTICIPATED AND POTENTIAL POLLUTANTS

Using Table 6, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

TABLE 6: ANTICIPATED AND POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE

	General Pollutant Categories								
PDP Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P[1]	P[2]	P	X
Commercial Development 1 acre or greater	P[1]	P[1]		P[2]	X	P[5]	X	P[3]	P[5]
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X[4][5]	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft²	X	X			X	X	X		X
Parking Lots	P[1]	P[1]	X		X	P[1]	X		P[1]
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P[1]	X	X[4]	X	P[5]	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

PROJECT POLLUTANTS OF CONCERN SUMMARY TABLE

Please summarize the identified project pollutants-of-concern by checking the appropriate boxes in the table below and list any surface water impairments identified. Pollutants anticipated to be generated by the project, which are also causing impairment of receiving waters, shall be considered the primary pollutants of concern. For projects where no primary pollutants of concern exist, those pollutants identified as anticipated shall be considered secondary pollutants of concern.

TABLE 7: PROJECT POLLUTANTS OF CONCERN

Pollutant Category	Anticipated (X)	Potential (P)	Surface Water Impairments
Sediments	X		
Nutrients	X		
Heavy Metals	X		
Organic Compounds	X		
Trash & Debris	X		
Oxygen Demanding Substances	X		
Oil & Grease	X		
Bacteria & Viruses			
Pesticides	X		

STEP 5

LID AND SITE DESIGN STRATEGIES

Each numbered item below is a Low Impact Development (LID) requirement of the WPO. Please check the box(s) under each number that best describes the LID BMP(s) and Site Design Strategies selected for this project. LID BMPs selected on this table will be typically represented as a self-retaining area, self-treating area, pervious pavement and greenroof, which, should be delineated in the Drainage Management Area map in Attachment C.

TABLE 8: LID AND SITE DESIGN

1. Conserve natural Areas, Soils, and Vegetation
☒ Preserve well draining soils (Type A or B)
☒ Preserve Significant Trees
☐ Preserve critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions
☐ Other. Description:
2. Minimize Disturbance to Natural Drainages
☒ Set-back development envelope from drainages
☐ Restrict heavy construction equipment access to planned green/open space areas
☐ Other. Description:
3. Minimize and Disconnect Impervious Surfaces (see 5)
☐ Clustered Lot Design
☒ Items checked in 5
☐ Other. Description:
4. Minimize Soil Compaction
☐ Restrict heavy construction equipment access to planned green/open space areas
☒ Re-till soils compacted by construction vehicles/equipment
☐ Collect & re-use upper soil layers of development site containing organic materials
☐ Other. Description:
5. Drain Runoff from Impervious Surfaces to Pervious Areas
LID Street & Road Design
☒ Curb-cuts to landscaping
☒ Rural Swales / Bio Retention /
☐ Concave Median
☐ Cul-de-sac Landscaping Design
☐ Other. Description:

LID Parking Lot Design	
☐	Permeable Pavements
☒	Curb-cuts to landscaping
☐	Other. Description:
LID Driveway, Sidewalk, Bike-path Design	
☐	Permeable Pavements
☒	Pitch pavements toward landscaping
☐	Other. Description:
LID Building Design	
☐	Cisterns & Rain Barrels
☒	Downspout to swale or landscaping
☐	Vegetated Roofs
☐	Other. Description:
LID Landscaping Design	
☒	Soil Amendments
☒	Reuse of Native Soils
☒	Smart Irrigation Systems
☐	Street Trees
☐	Other. Description:
6. Minimize erosion from slopes	
☐	Disturb existing slopes only when necessary
☒	Minimize cut and fill areas to reduce slope lengths
☐	Incorporate retaining walls to reduce steepness of slopes or to shorten slopes
☐	Provide benches or terraces on high cut and fill slopes to reduce concentration of flows
☒	Rounding and shaping slopes to reduce concentrated flow
☒	Collect concentrated flows in stabilized drains and channels
☐	Other. Description:

STEP 6

SOURCE CONTROL

Please complete the checklist on the following pages to determine Source Control BMPs. Below is instruction on how to use the checklist. (Also see instructions on page 60 of the *SUSMP)*

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies and list in Table 9.

2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Source Control Exhibit in Attachment B.

3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs into Table 9.

4. Use the format in Table 9 below to summarize the project Source Control BMPs. Incorporate all identified Source Control BMPs in your Source Control Exhibit in Attachment B.

TABLE 9: PROJECT SOURCE CONTROL BMPS

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
LANDSCAPE / PESTICIDES	PRESERVE TREES + NATIVE VEGETATION	MAINTAIN LANDSCAPE
		AVOID PESTICIDES MIN. FERTILIZER
		MIN. IRRIGATING RUNOFF
STREETS + DRIVEWAYS		SWEEP D/W + CLEAN ROADS

Describe your specific Source Control BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting Source Control BMPs or substituting alternatives.

SEE NEXT PAGE

SOURCE CONTROL BMPS

The 'Top of the Pines' Development will:

- Minimize length and width of paved driveways and access roads.
- Place building pads in the flattest areas to minimize grading.
- Minimize hardscape on graded pads.
- Provide permanent landscape on all disturbed unpaved areas.
- Minimize disturbance to natural drainage channels.
- Provide efficient irrigation systems per SD-12 and monitor for over irrigation.
- Provide educational information to property owners.
- Provide drainage outlet protection, rip-rap energy dissipation devices, to ensure sediment is not disturbed and transferred.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in Table 9 and Narrative**	4 **Operational BMPs—Include in Table 9 and Narrative**
☐ **A.** On-site storm drain inlets	☐ Locations of inlets.	☐ Mark all inlets with the words "No Dumping! Flows to Bay" or similar where feasible.	☐ Maintain and periodically repaint or replace inlet markings. ☐ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☐ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ **B.** Interior floor drains and elevator shaft sump pumps		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C.** Interior parking garages		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in Table 9 and Narrative**	4 **Operational BMPs—Include in Table 9 and Narrative**
☐ **D1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in Table 9 and Narrative**	4 **Operational BMPs—Include in Table 9 and Narrative**
☒ **D2.** Landscape/ Outdoor Pesticide Use Note: Should be consistent with project landscape plan (if applicable).	☒ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment facilities.	State that final landscape plans will accomplish all of the following: ☒ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ☐ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ☐ Consider using pest-resistant plants, especially adjacent to hardscape. ☐ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☒ Maintain landscaping using minimum or no pesticides. ☒ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☒ Provide IPM information to new owners, lessees and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in Table 9 and Narrative**	4 **Operational BMPs—Include in Table 9 and Narrative**
☐ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☐ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	☐ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☐ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the draving, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in Table 9 and Narrative**	4 **Operational BMPs—Include in Table 9 and Narrative**
❑ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants – List in Table 9**	**2** **Permanent Controls—Show on Source Control Exhibit, Attachment B**	**3** **Permanent Controls—List in Table 9 and Narrative**	**4** **Operational BMPs—Include in Table 9 and Narrative**
☐ I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	☐ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	☐ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

☐ **J. Vehicle and Equipment Cleaning**	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☐ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** ☐ **Car dealerships and similar may rinse cars with water only.** ☐ **See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

☐ **K. Vehicle/Equipment Repair and Maintenance**	☐ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ☐ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ☐ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	☐ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ☐ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ☐ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the SUSMP report, note that all of the following restrictions apply to use the site: ☐ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ☐ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ☐ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

☐ L. Fuel Dispensing Areas	☐ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

☐ **M.** Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which ☐ shall be kept closed during periods of operation. Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer. ☐		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
☒ **N.** Fire Sprinkler Test Water		☐ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☐ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STEP 7

LID AND TREATMENT CONTROL SELECTION

A treatment control BMP and/or LID IMP must be selected to treat the project pollutants of concern identified in Table 7 "Project Pollutants of Concern". A treatment control facility with a high or medium pollutant removal efficiency for the project's most significant pollutant of concern shall be selected. It is recommended to use the design procedure in Chapter 4 of the SUSMP to meet NPDES permit LID requirements, treatment requirements, and flow control requirements. If your project does not utilize this approach, the project will need to demonstrate compliance with LID, treatment and hydromodification flow control requirements. Review Chapter 2 "Selection of Stormwater Treatment Facilities" in the SUSMP to assist in determining the appropriate treatment facility for your project.

Will this project be utilizing the unified LID design procedure as described in Chapter 4 of the Local SUSMP? *(If yes, please document in Attachment D following the steps in Chapter 4 of the County SUSMP)*	
Yes	No
If this project is not utilizing the unified LID design procedure, please describe how the alternative treatment facilities will comply with applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria.	

➢ Indicate the project pollutants of concern (POCs) from Table 7 in Column 2 below.

TABLE 10: GROUPING OF POTENTIAL POLLUTANTS of Concern (POCs) by fate during stormwater treatment

Pollutant	Check Project Specific POCs	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	✓	X	X	
Nutrients	✓		X	X
Heavy Metals	✓		X	
Organic Compounds	✓		X	
Trash & Debris	✓	X		
Oxygen Demanding	✓		X	
Bacteria	✓		X	
Oil & Grease	✓		X	
Pesticides	✓		X	

➢ Indicate the treatment facility(s) chosen for this project in the following table.

TABLE 11: GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Devices (LID)	Media Filters	Higher-rate biofilters	Higher-rate media filters	Trash Racks & Hydro-dynamic Devices	Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low

➢ Please check the box(s) that best describes the Treatment Control BMP(s) and/or LID IMP selected for this project. Please check if the treatment facility is designed for water quality or hydromodification flow control.

TABLE 12: PROJECT LID AND TC-BMPS

LID and TC-BMP Type	Water Quality Treatment Only	Hydromodification Flow Control
Bioretention Facilites (LID)		
☒ Bioretention area		X
☐ Flow-through Planter		
☐ Cistern with Bioretention		
Settling Basins (Dry Ponds)		
☐ Extended/dry detention basin with grass/vegetated lining		
☐ Extended/dry detention basin with impervious lining		
Infiltration Devices (LID)		
☐ Infiltration basin		
☐ Infiltration trench		
☐ Other_____		

Wet Ponds and Constructed Wetlands		
☐ Wet pond/basin (permanent pool)		
☐ Constructed wetland		
Vegetated Swales (LID[1])		
☐ Vegetated Swale		
Media Filters		
☐ Austin Sand Filter		
☐ Delaware Sand Filter		
☐ Multi-Chambered Treatment Train (MCTT)		
Higher-rate Biofilters		
☐ Tree-pit-style unit		
☐ Other_____		
Higher-rate Media Filters		
☐ Vault-based filtration unit with replaceable cartridges		
☐ Other_____		
Hydrodynamic Separator Systems		
☐ Swirl Concentrator		
☐ Cyclone Separator		
Trash Racks		
☐ Catch Basin Insert		
☐ Catch Basin Insert w/ Hydrocarbon boom		
☐ Other_____		

[1] Must be designed per SUSMP "Vegetated Swales" design criteria for water quality treatment credit (p. 65).

For design guidelines and calculations refer to Chapter 4 "Low Impact Development Design Guide" in the SUSMP. Please show all calculations and design sheets for all treatment control BMPs proposed in Attachment D.

➢ Create a Construction Plan SWMP Checklist for your project.

Instructions on how to fill out table

1. Number and list each measure or BMP you have specified in your SWMP in Columns 1 and Maintenance Category in Column 3 of the table. Leave Column 2 blank.

2. When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 2, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. **This table must be shown on the front sheet of the grading and improvement plans.**

Stormwater Treatment Control BMPs and LID BMPs			
Description / Type	Sheet	Maintenance Category	Revisions
BIORETENTION	PRE GRADE	FIRST	
IRRIGATION / MONITOR	" "	FIRST	
DRAIN OUTLET PROTECTION	" "	FIRST	

BMP's approved as part of Stormwater Management Plan (SWMP) dated xx/xx/xx on file with DPW. Any changes to the above BMP's will require SWMP revision and Plan Change approvals.

- Please describe why the chosen treatment control BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a **feasibility analysis** that demonstrates utilization of a treatment control BMP with a high or medium removal efficiency ranking is infeasible.

SEE NEXT PAGE

Please provide the sizing design calculations for each Drainage Management Area in Attachment D. Guidelines for design calculations are located in Chapter 4 of the County SUSMP. To assist in these calculations a BMP sizing calculator is available for use at the following location: http://www.projectcleanwater.org/html/wg_susmp.html

YES

TREATMENT CONTROL BMPS

The 'Top of the Pines' Development will:

- Provide bioretention area at specified runoff location from the paved access road.
- Provide "biofiltration" landscape areas on the graded pads adjacent to impervious surfaces.
- Provide energy dissipaters to slow runoff at discharge points and allow for particulates to settle.

STEP 8

OPERATION AND MAINTENANCE

➢ Please check the box that best describes the maintenance mechanism(s) for this project.

TABLE 13: PROJECT BMP CATEGORY

CATEGORY	SELECTED		BMP Description
	YES	NO	
First[1]	✓		BIO RETENTION
Second[2]			IRRIGATION + LANDSCAPE MONITOR
Third[3]			DRAIN OUT FLOW PROTECTION
Fourth[4]			MAINTENANCE

Note:

1. A maintenance notification will be required.
2. A recorded maintenance agreement and access easement will be required.
3. The project will be required to establish or be included in a watershed specific Community Facility District (CFD) for long-term maintenance.
4. The developer would be required to dedicate the BMP (and the property on which it is located and any necessary access) to the County.

➢ Please list all individual LID and Treatment Control BMPs (TC-BMPs) incorporated into the project. Please ensure the "BMP Identifier" is consistent with the legend in Attachment C "Drainage Management Area Exhibit". Please attach the record plan sheets upon completion of project and amend the Major SWMP where appropriate. For each type of LID or TC-BMP provide an inspection sheet in Attachment F "Maintenance Plan".

TABLE 14: PROJECT SPECIFIC LID AND TC-BMPS

BMP Identifier*: (Identifier to match TC-BMPs on TC-BMP Table.)	Type	Record Plan Page for TC-BMP	BMP Pollutant of Concern Efficiency (H,M,L)
TC-32	BIO RETENTION	H,H,H	- H
SD-10	PLANT COVERAGE / LANDSCAPE		
SD-12	IRRIGATION MONITORING		

* For location of BMP's, see approved Record Plan dated XX/XX/XX, plan (TYPE) sheet (#)

➢ Responsible Party for Long-term Maintenance:

Identify the parties responsible for long-term maintenance of the BMPs identified above and Source Controls specified in Attachment B. Include the appropriate written agreement with the entities responsible for O&M in Attachment F. Please see Chapter 5 "Stormwater Facility Maintenance" of the County SUSMP for appropriate maintenance mechanisms.

Representative Name:	RANDY LOPEZ
Company Name:	ONE PAC COMPANY
Phone Number:	(602) 263-6502
Street Address:	2727 N. CENTRAL AVE
City/State/Zip:	PHOENIX, AZ 85004
Email Address:	RANDY-LOPEZ@U HAUL.COM

➢ Funding Source:

Provide the funding source or sources for long-term operation and maintenance of each BMP identified above. Please see Chapter 5 "Stormwater Facility Maintenance" of the County SUSMP for the appropriate funding source options. By certifying the Major SWMP the applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners.

FUNDING FOR LONG TERM OPERATION + MAINTENANCE FOR EACH BMP SHALL BE PROVIDED BY THE OWNER, ONE PAC COMPANY

ATTACHMENTS

Please include the following attachments.

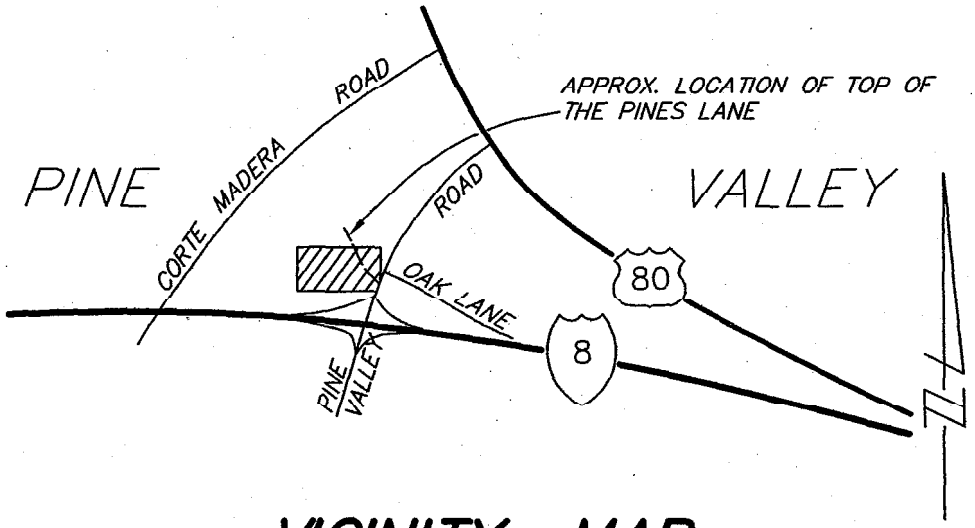
	ATTACHMENT	COMPLETED	N/A
A	Project Location Map	✓	
B	Source Control Exhibit	✓	
C	Drainage Management Area (DMA)Exhibit	✓	
D	BMP Sizing Design Calculations (Water Quality and Hydromodification) and TC-BMP/IMP Design Details	✓	
E	Geotechnical Certification Sheet	✓	
F	Maintenance Plan	✓	
G	Treatment Control BMP Certification	✓	
H	HMP Exemption Documentation		
I	Addendum		

Note: Attachments B and C may be combined.

ATTACHMENT A

Project Location Map

TOP OF THE PINES POST-DEVELOPMENT



VICINITY MAP

NOT TO SCALE
THOMAS. BROS. 1237B7

ATTACHMENT B

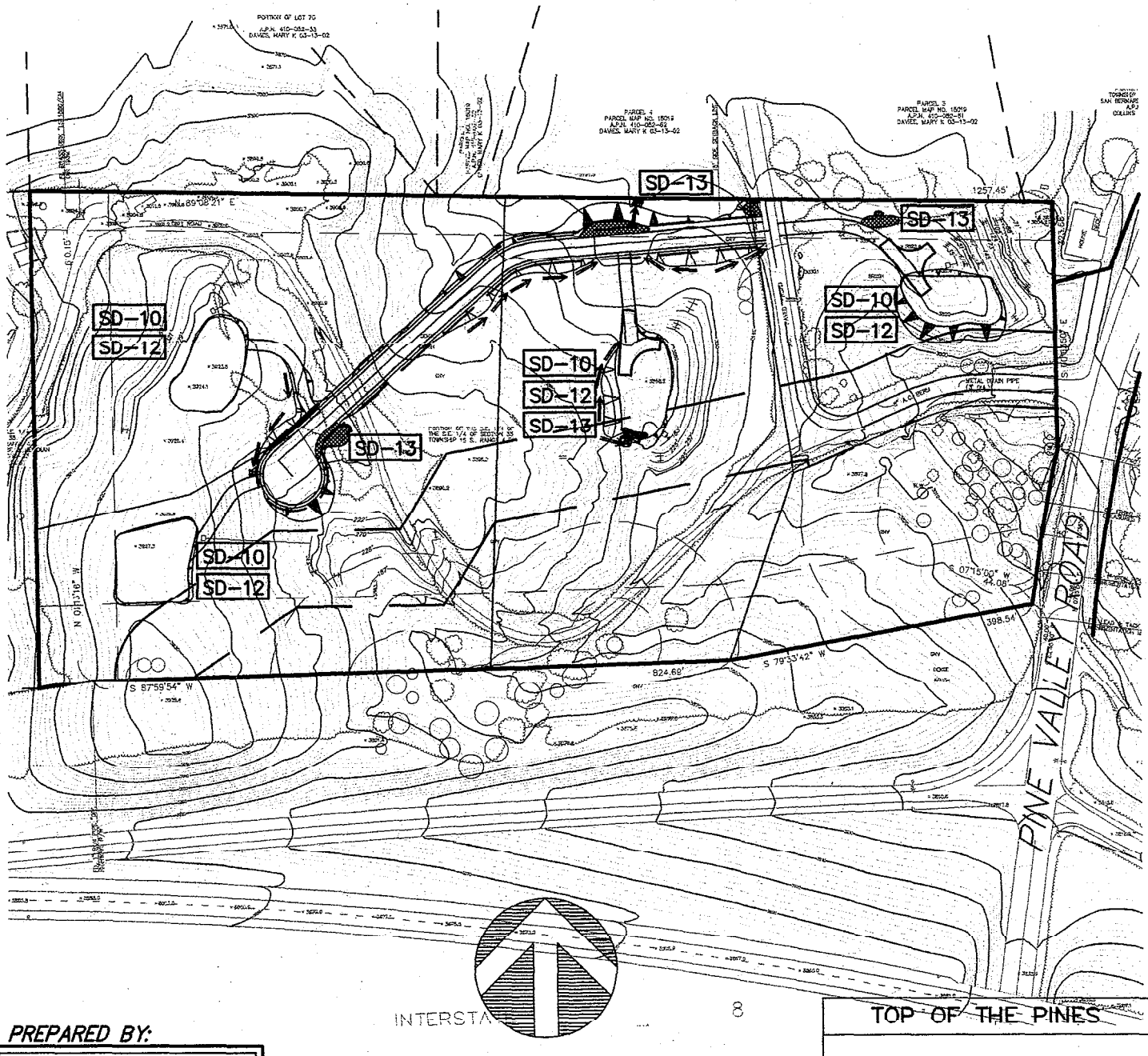
Source Control Exhibit

TOP OF THE PINES SOURCE CONTROL BMPS

SITE DESIGN & PERMINANT LANDSCAPE SD-10

EFFICIENT IRRIGATION SYSTEMS SD-12

OUTLET PROTECTION (VELOCITY DISSIPATION DEVICES) SD-13



SCALE: 1"= 200'

0 100 200 400

PREPARED BY:

FITZMAURICE CONSULTING.
-CIVIL ENGINEERING-
1666 GARNET AVE, SUITE 410
SAN DIEGO, CALIFORNIA 92109
(858) 752-2393
www.fitzmaurice-consulting.com

TOP OF THE PINES

SOURCE CONTROL BMPS

ATTACHMENT C

Drainage Management Area (DMA) Exhibit

ATTACHMENT D

Sizing Design Calculations and TC-BMP/LID Design Details

(Provide BMP Sizing Calculator results and/or continuous simulation modeling results, if applicable)

TOP OF THE PINES DMAs

DMA	AREA	SURFACE	TO BMP	AREA (ACRES)	BASIN TOTALS
1	7,659	LANDSCAPE	TO BMP 1	0.18	
2	2,000	ROOF	" "	0.05	
3	2,184	AC/CONC.	" "	0.05	
4	6,604	LANDSCAPE	" "	0.15	
5	2,000	ROOF	" "	0.05	
6	2,310	AC/CONC	" "	0.05	
7	23,183	LAND/NAT.	SELF TREAT	0.53	
8	6,102	AC/CONC	TO BMP 1	0.14	1.20 AC
9	3,522	AC/CONC	TO BMP 2	0.08	
10	11,519	AC/CONC	TO BMP 2	0.26	
11	60,569	LAND/NAT	SELF TREAT	1.39	
12	6,994	LAND/NAT	SELF TREAT	0.16	1.89 AC
13	3,980	AC/CONC	TO BMP 3	0.09	
14	2,709 SF	FAL/AC		0.06	
15	11,534	LAND/NAT	SELF TREAT	0.26	0.41 AC
16	5,182	LANDSCAPE	TO BMP 4	0.12	
17	2,000	ROOF	TO BMP 4	0.05	
18	4,520	AC/CONC	TO BMP 4	0.10	0.27
19	6,600	LANDSCAPE	TO BMP 5	0.15	
20	2000	ROOF	TO BMP 5	0.05	0.2

CALCULATOR GENERATED DATA

IMP	TYPE	AREA (SF)	VOLUME 1 (CF)	V2
1	BIO-RET	1430 SF	1,192 CF	0
2	BIO-RET	1,260 SF	1050 CF	0
3	BIO-RET	335 CF	280 CF	0
4	BIO-RET	613 SF	511 CF	0
5	BIO-RET	255 SF	213 CF	0

NOTE: SOIL TYPE B DOES NOT REQUIRE V2 NOR OUTFLOW ORIFACE

Project Summary

Project Name	Top of the Pines
Project Applicant	One Pac Company
Jurisdiction	County of San Diego
Parcel (APN)	410-030-17
Hydrologic Unit	Tijuana

Compliance Basin Summary

Basin Name:	Site Basin West
Receiving Water:	Western POC
Rainfall Basin	Lake Wohlford
Mean Annual Precipitation (inches)	20.0
Project Basin Area (acres):	1.19
Watershed Area (acres):	1.19
SCCWRP Latera Channel Susceptiblity (H, M, L):	
SCCWRP Vertifical Channel Susceptiblity (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

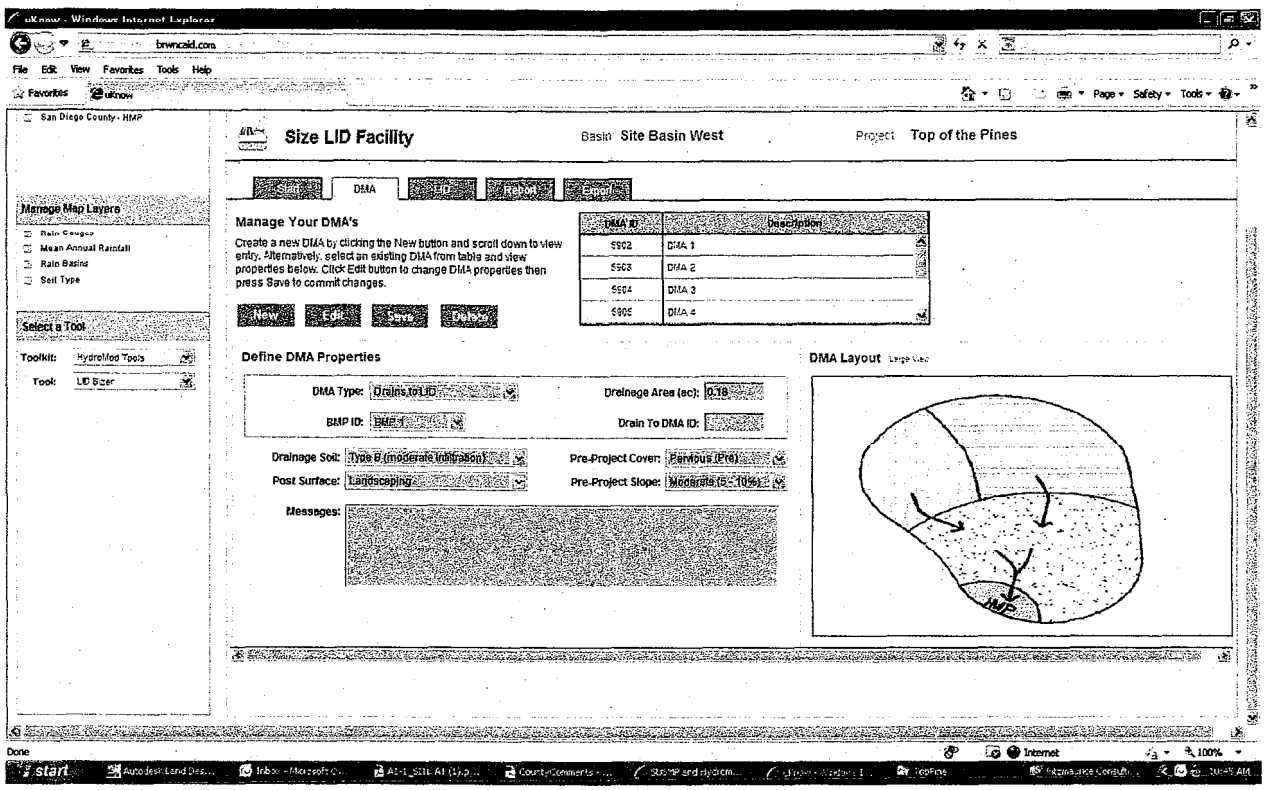
Drainage Management Area Summary

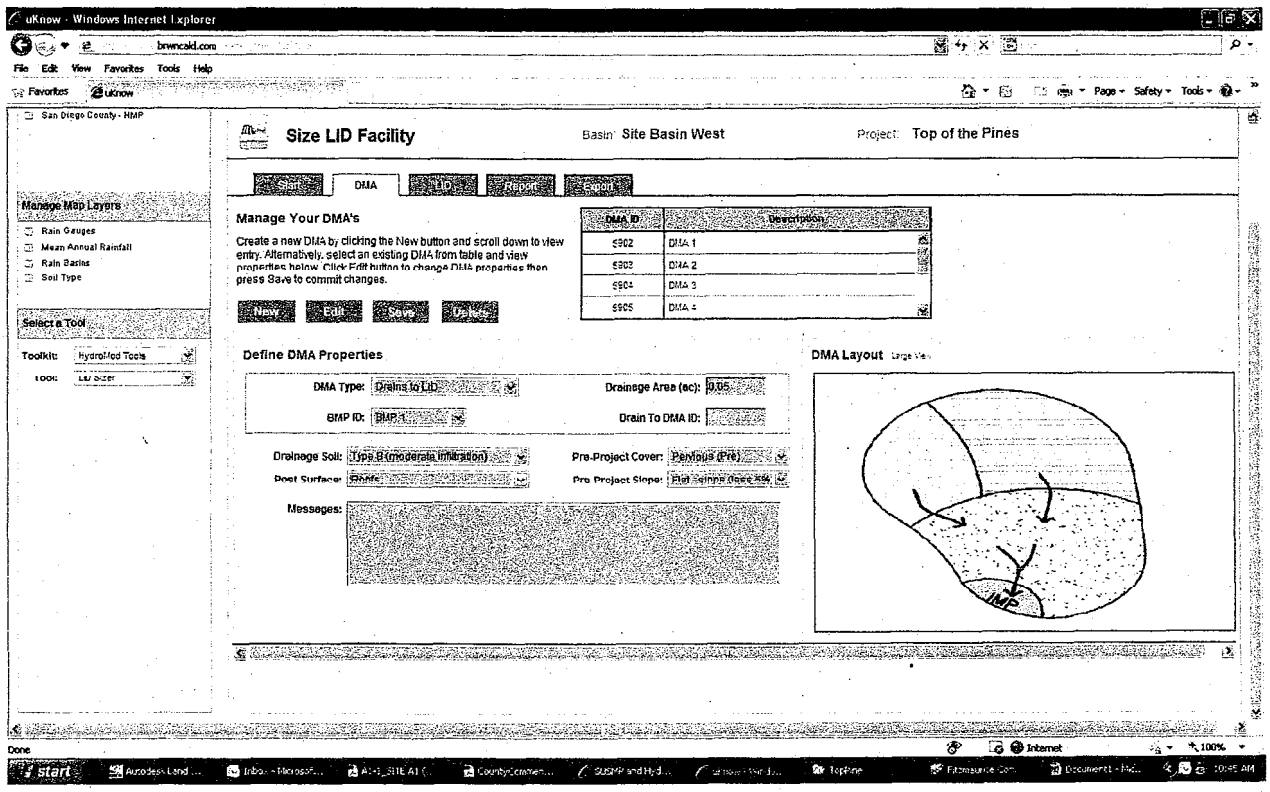
ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
5902	Drains to LID	BMP 1	DMA 1	0.18	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)
5903	Drains to LID	BMP 1	DMA 2	0.05	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Flat - slope (less ..
5904	Drains to LID	BMP 1	DMA 3	0.05	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)
5905	Drains to LID	BMP 1	DMA 4	0.15	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Flat - slope (less ..
5906	Drains to LID	BMP 1	DMA 5	0.05	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Flat - slope (less ..
5907	Drains to LID	BMP 1	DMA 6	0.05	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)
5908	Self-Treating	BMP 1	DMA 7	0.53	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)
5937	Drains to LID	BMP 1	DMA 8	0.14	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Flat - slope (less ..

LID Facility Summary

WEST BASIN / BMP 1

BMP ID	Type	Description	Plan Area (scft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 1	Bioretention	Bioretention West	1428	1190	0.00	0.014	0.6


uKnow - Windows Internet Explorer
brwncald.com
File Edit View Favorites Tools Help
Favorites uKnow
Page Safety Tools
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Site
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5902
DMA 1
5903
DMA 2
5904
DMA 3
5905
DMA 4
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.19
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Landscaping
Pre-Project Slope: Moderate (5 - 10%)
Messages:
DMA Layout
IMP
Done
Internet
100%
start


uKnow - Windows Internet Explorer
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File Edit View Favorites Tools Help
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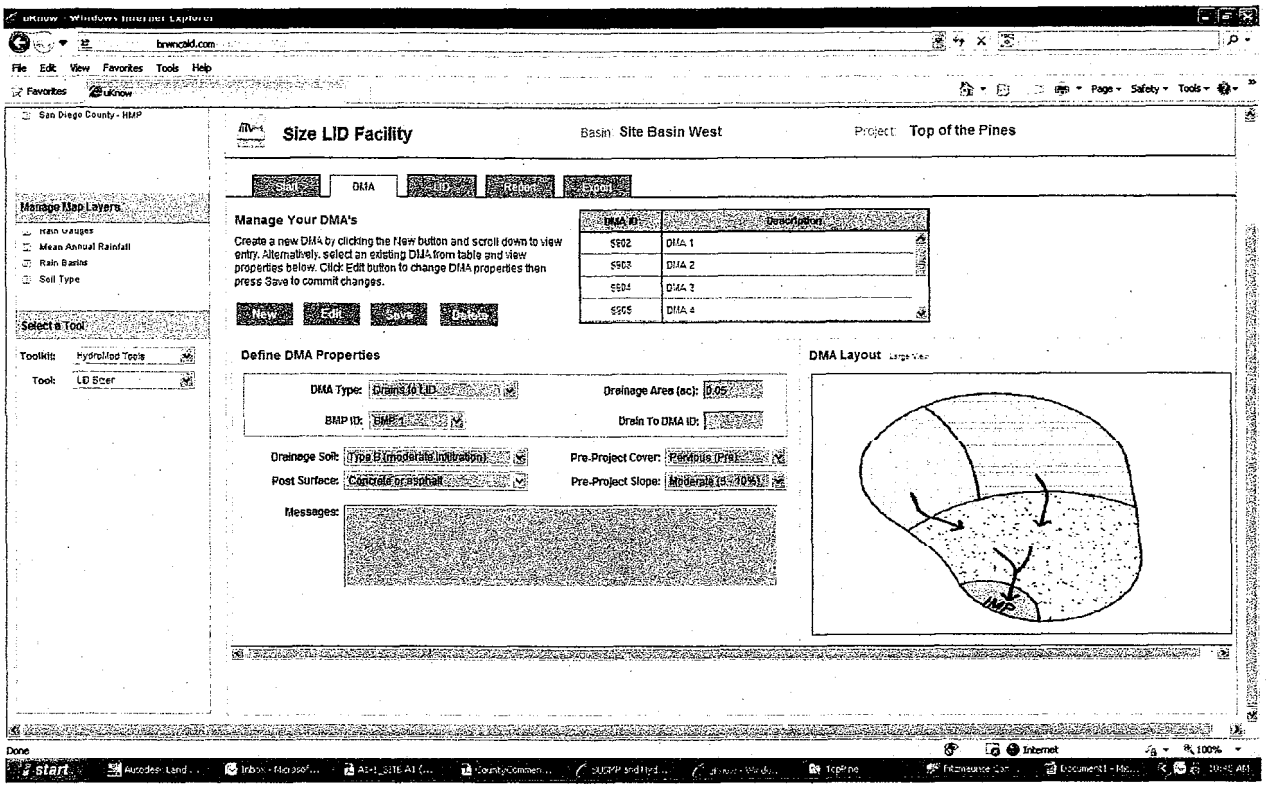
Page Safety Tools
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Site
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5902
DMA 1
5903
DMA 2
5904
DMA 3
5905
DMA 4
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Grade
Pre-Project Slope: Flat (slope does not
Messages:
DMA Layout
IMP
Done
Internet
100%
start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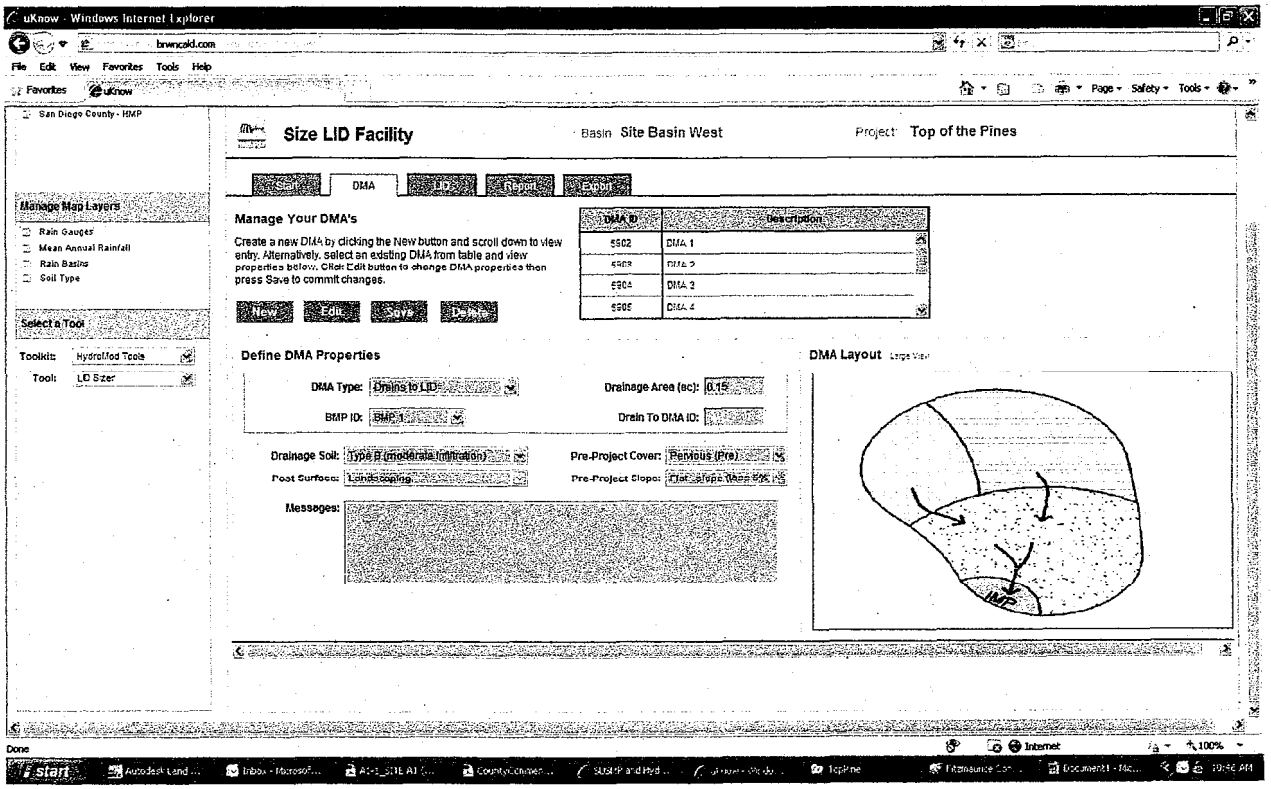
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Site
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5902
DMA 1
5903
DMA 2
5904
DMA 3
5905
DMA 4
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Concrete or asphalt
Pre-Project Slope: Moderate (3 - 10%)
Messages:
DMA Layout
BMP
Done
Internet
100%
start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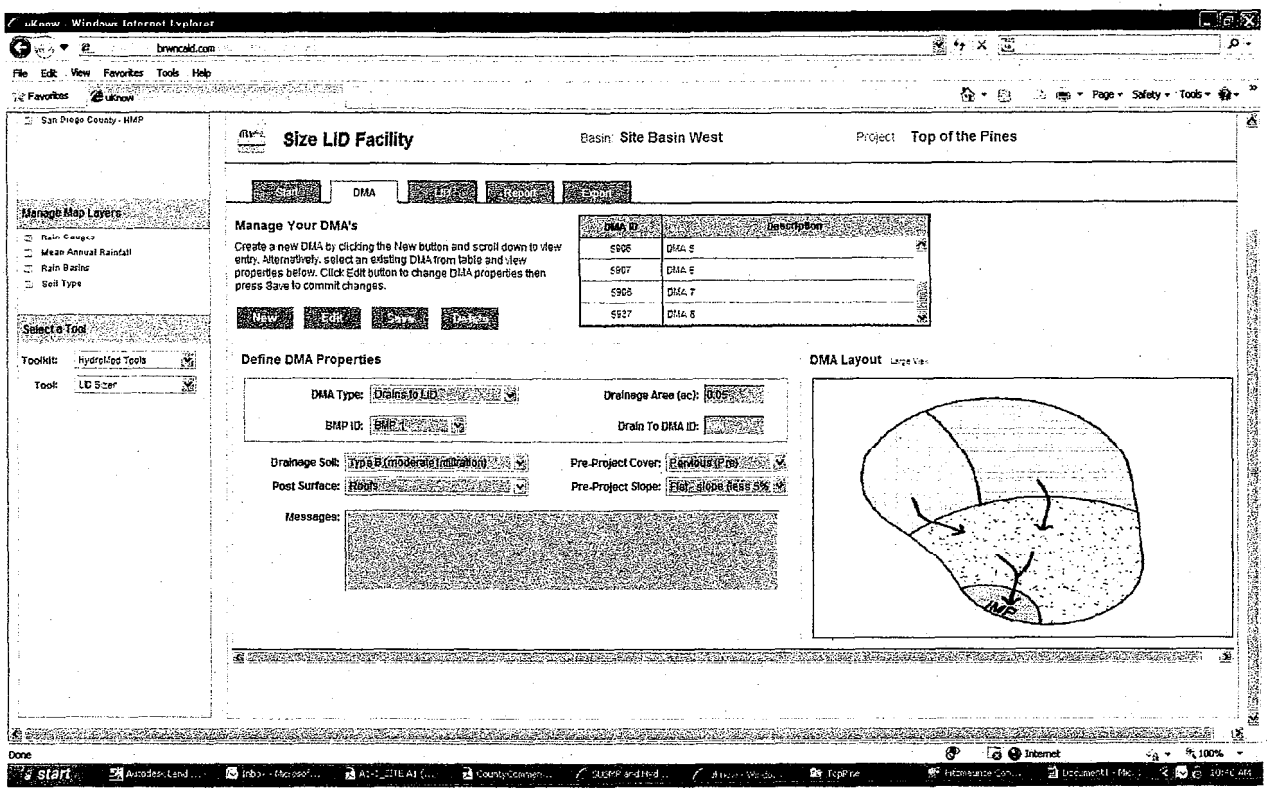
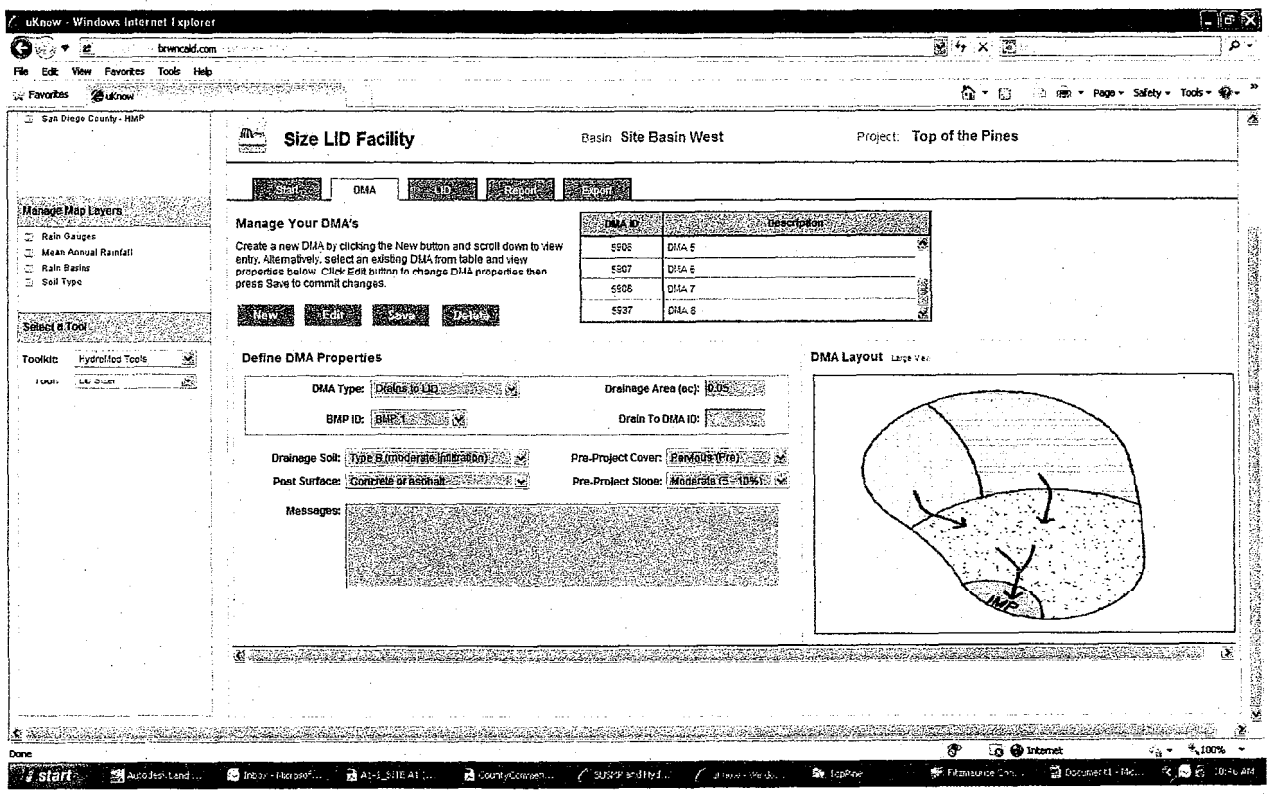
File Edit View Favorites Tools Help
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Site
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5902
DMA 1
5903
DMA 2
5904
DMA 3
5905
DMA 4
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.15
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Landscaping
Pre-Project Slope: Flat (slope less 3%)
Messages:
DMA Layout
BMP
Done
Internet
100%
start


uKnow - Windows Internet Explorer
brwncald.com
File Edit View Favorites Tools Help
San Diego County - HMP
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5906
DMA 5
5907
DMA 6
5908
DMA 7
5937
DMA 8
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Roofs
Pre-Project Slope: Flat, slope less 5%
Messages:
DMA Layout
Done
Internet
100%
start


uKnow - Windows Internet Explorer
brwncald.com
File Edit View Favorites Tools Help
San Diego County - HMP
Size LID Facility
Basin: Site Basin West
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5906
DMA 5
5907
DMA 6
5908
DMA 7
5937
DMA 8
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 1
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Concrete or asphalt
Pre-Project Slope: Moderate (5 - 10%)
Messages:
DMA Layout
Done
Internet
100%
start

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San Diego County - HMP

Size LID Facility

Basin: Site Basin West

Project: Top of the Pines

Start | DMA | LID | Report | Export

Manage Map Layers

- Rain Gauges
- Mean Annual Rainfall
- Rain Basins
- Soil Type

Select a Tool

Toolkit: Hydromod Tools

Tool: LID Sizer

Manage Your DMA's

Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.

New | Edit | Save | Delete

DMA ID	Description
5906	DMA 5
5907	DMA 6
5908	DMA 7
5927	DMA 8

Define DMA Properties

DMA Type: Self-Treating | Drainage Area (ac): 0.53

BMP ID: | Drain To DMA ID:

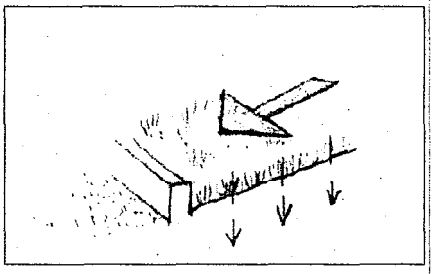
Drainage Soil: Type B (moderate infiltration) | Pre-Project Cover:

Post Surface: | Pre-Project Slope:

Messages:

DMA Layout

Large View



Done

Internet 100%

start | Autodesk Land... | Inbox - Microsof... | A1-1_SITE A1 ... | CountyCommen... | SUSMP and Hyd... | TopPine | Fitzmaurice Corr... | Document1 - Mic... | 10:47 AM

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bmpcalc.com

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San Diego County - HMP

Size LID Facility

Basin: Site Basin West

Project: Top of the Pines

Start | DMA | LID | Report | Export

Manage Map Layers

- Rain Gauges
- Mean Annual Rainfall
- Rain Basins
- Soil Type

Select a Tool

Toolkit: Hydromod Tools

Manage Your DMA's

Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.

New | Edit | Save | Delete

DMA ID	Description
5906	DMA 5
5907	DMA 6
5908	DMA 7
5927	DMA 8

Define DMA Properties

DMA Type: Drains to LID | Drainage Area (ac): 0.14

BMP ID: BMP 1 | Drain To DMA ID:

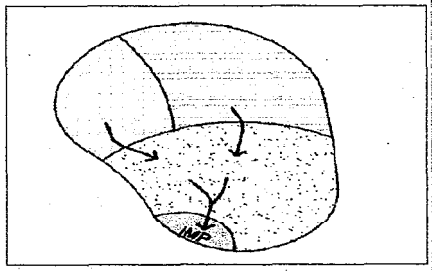
Drainage Soil: Type B (moderate infiltration) | Pre-Project Cover: Pervious (Pre)

Post Surface: Concrete or Asphalt | Pre-Project Slope: Flat - slope (less 5%)

Messages:

DMA Layout

Large View



Done

Internet 100%

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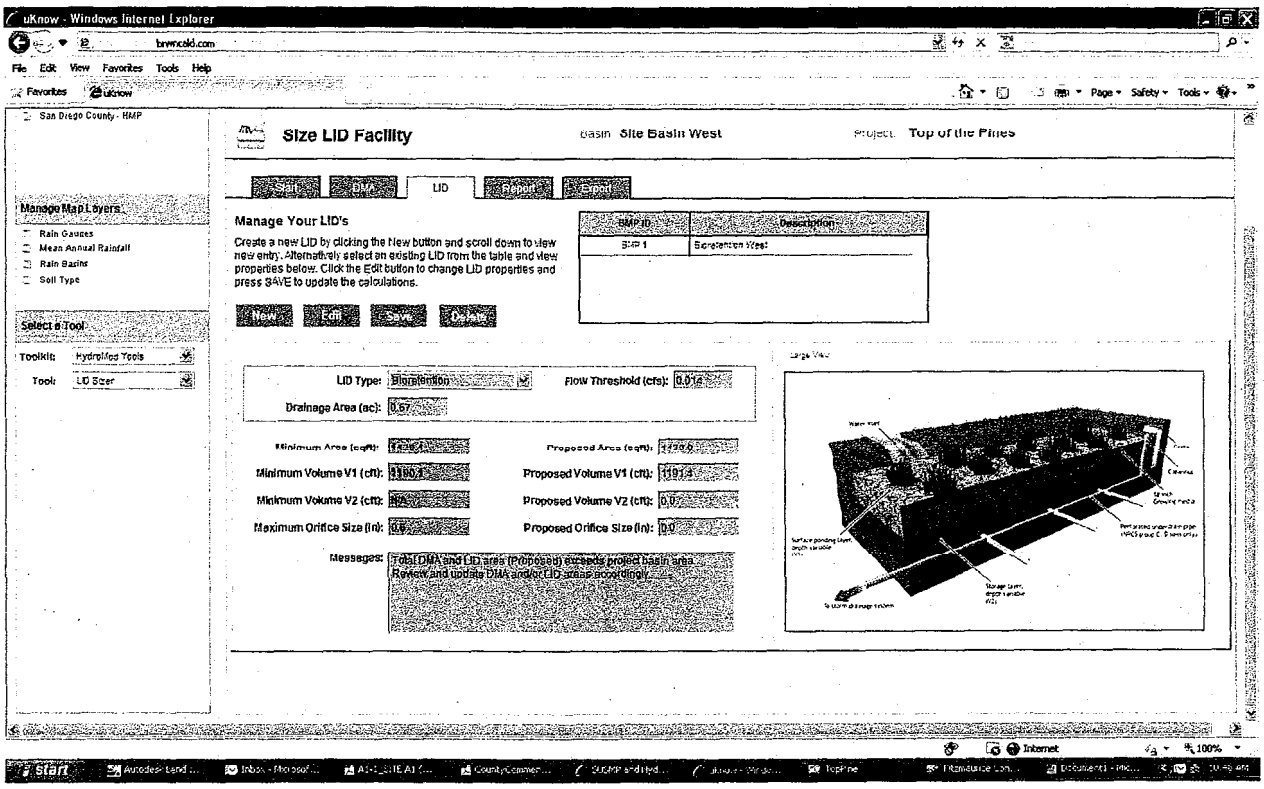
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San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin Site Basin West
Project Top of the Pines
Site
DMA
LID
Report
Export
Manage Your LID's
Create a new LID by clicking the New button and scroll down to view new entry. Alternatively select an existing LID from the table and view properties below. Click the Edit button to change LID properties and press SAVE to update the calculations.
BMP ID
Description
BMP 1
Bioretention West
New
Edit
Save
Delete
LID Type: Bioretention
Flow Threshold (cfs): 0.014
Drainage Area (ac): 0.67
Minimum Area (sqft):
Proposed Area (sqft):
Minimum Volume V1 (cft): 1180.1
Proposed Volume V1 (cft): 1191.6
Minimum Volume V2 (cft): N/A
Proposed Volume V2 (cft): 0.0
Maximum Orifice Size (in): 0.0
Proposed Orifice Size (in): 0.0
Messages:
Total DMA and LID area (Proposed) exceeds project basin area. Review and update DMA and/or LID areas accordingly.
Large View
Internet
100%
start

Project Summary

Project Name	Top of the Pines
Project Applicant	One Pac Company
Jurisdiction	County of San Diego
Parcel (APN)	410-030-17
Hydrologic Unit	Tijuana

Compliance Basin Summary

Basin Name:	Site Basin North
Receiving Water:	North Center Property Line
Rainfall Basin	Lake Wohlford
Mean Annual Precipitation (inches)	20.0
Project Basin Area (acres):	1.89
Watershed Area (acres):	1.89
SCCWRP Latera Channel Susceptiblity (H, M, L):	
SCCWRP Vertifical Channel Susceptiblity (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

Drainage Management Area Summary

ID	Type	BMP ID	Descripton	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
5940	Drains to LID	BMP 2	DMA 9	0.08	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)
5941	Drains to LID	BMP 2	DMA 10	0.26	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)
5942	Self-Treating	BMP 2	DMA 11	1.39	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)
5943	Self-Treating	BMP 2	DMA 12	0.16	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 2	Bioretention	Bioretention North off private road	1258	1048	0.00	0.007	0.4

SITE BASIN NORTH, BMP 2

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bnwcald.com

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Favorites uKnow

Page Safety Tools

San Diego County - HMP

Size LID Facility

Basin: Site Basin North

Project: Top of the Pines

Start | DMA | LID | Report | Export

Manage Map Layers

- Rain Gauges
- Mean Annual Rainfall
- Rain Basins
- Soil Type

Select a Tool

Toolkit: HydroMod Tools

Tool: LID Sizer

Manage Your DMA's

Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.

New | Edit | Save | Delete

DMA ID	Description
5940	DMA 9
5941	DMA 10
5942	DMA 11
5943	DMA 12

DMA Type: Drains to LID

Drainage Area (ac): 0.08

BMP ID: BMP 2

Drain To DMA ID:

Drainage Soil: Type B (moderate infiltration)

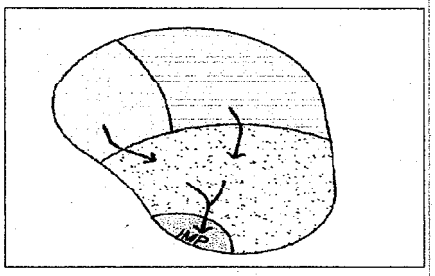
Pre-Project Cover: Pervious (Pre)

Post Surface: Concrete or asphalt

Pre-Project Slope: Moderate (5 - 10%)

Messages:

Large View



Done

Internet 100%

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bnwcald.com

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Favorites uKnow

Page Safety Tools

San Diego County - HMP

Size LID Facility

Basin: Site Basin North

Project: Top of the Pines

Start | DMA | LID | Report | Export

Manage Map Layers

- Rain Gauges
- Mean Annual Rainfall
- Rain Basins
- Soil Type

Select a Tool

Toolkit: HydroMod Tools

Tool: LID Sizer

Manage Your DMA's

Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.

New | Edit | Save | Delete

DMA ID	Description
5940	DMA 9
5941	DMA 10
5942	DMA 11
5943	DMA 12

DMA Type: Drains to LID

Drainage Area (ac): 0.08

BMP ID: BMP 2

Drain To DMA ID:

Drainage Soil: Type B (moderate infiltration)

Pre-Project Cover: Pervious (Pre)

Post Surface: Concrete or asphalt

Pre-Project Slope: Moderate (5 - 10%)

Messages:

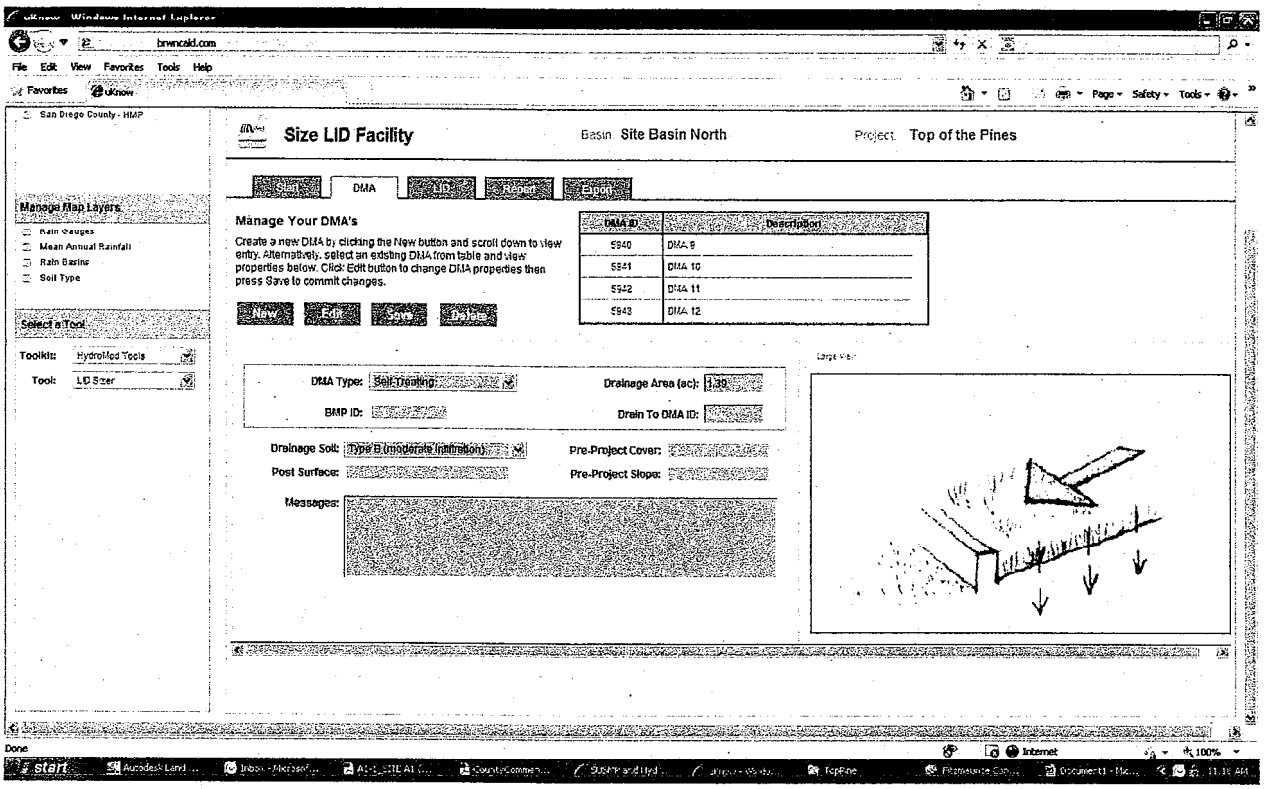
Large View

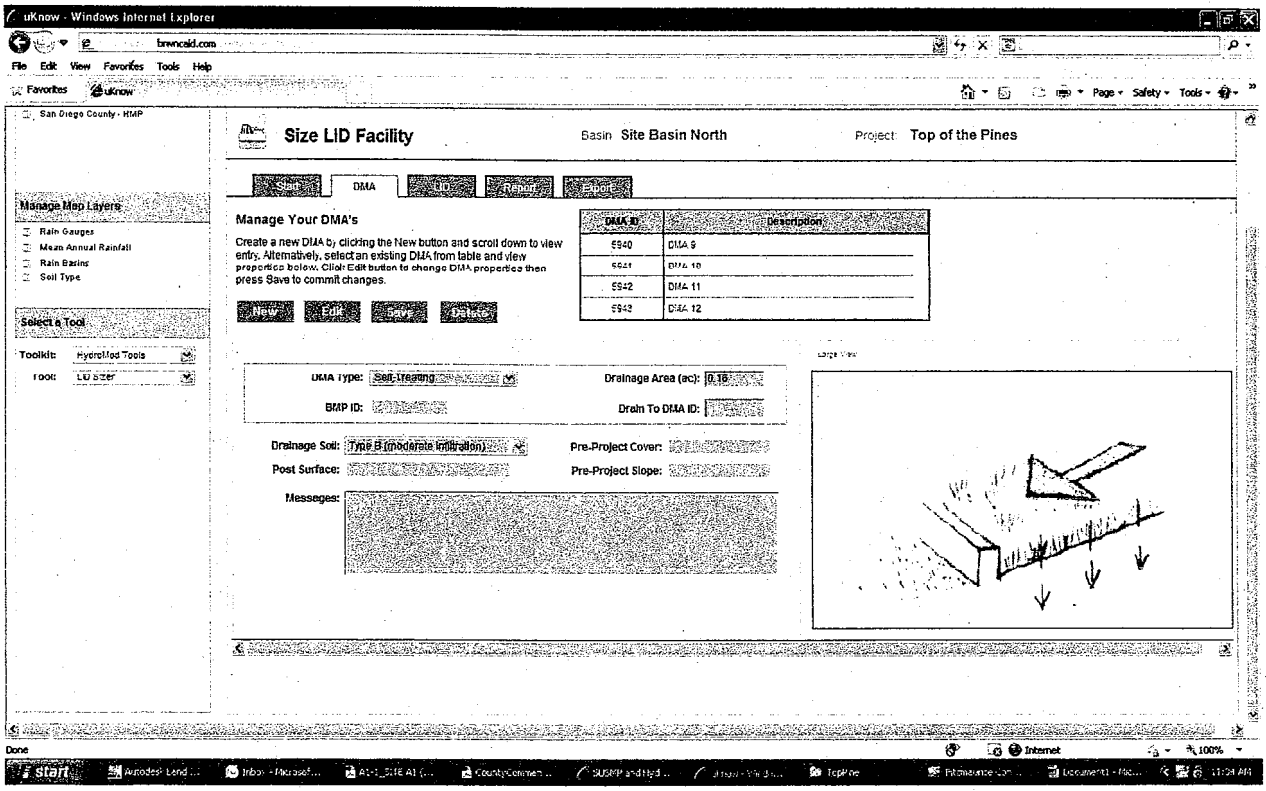
IMP

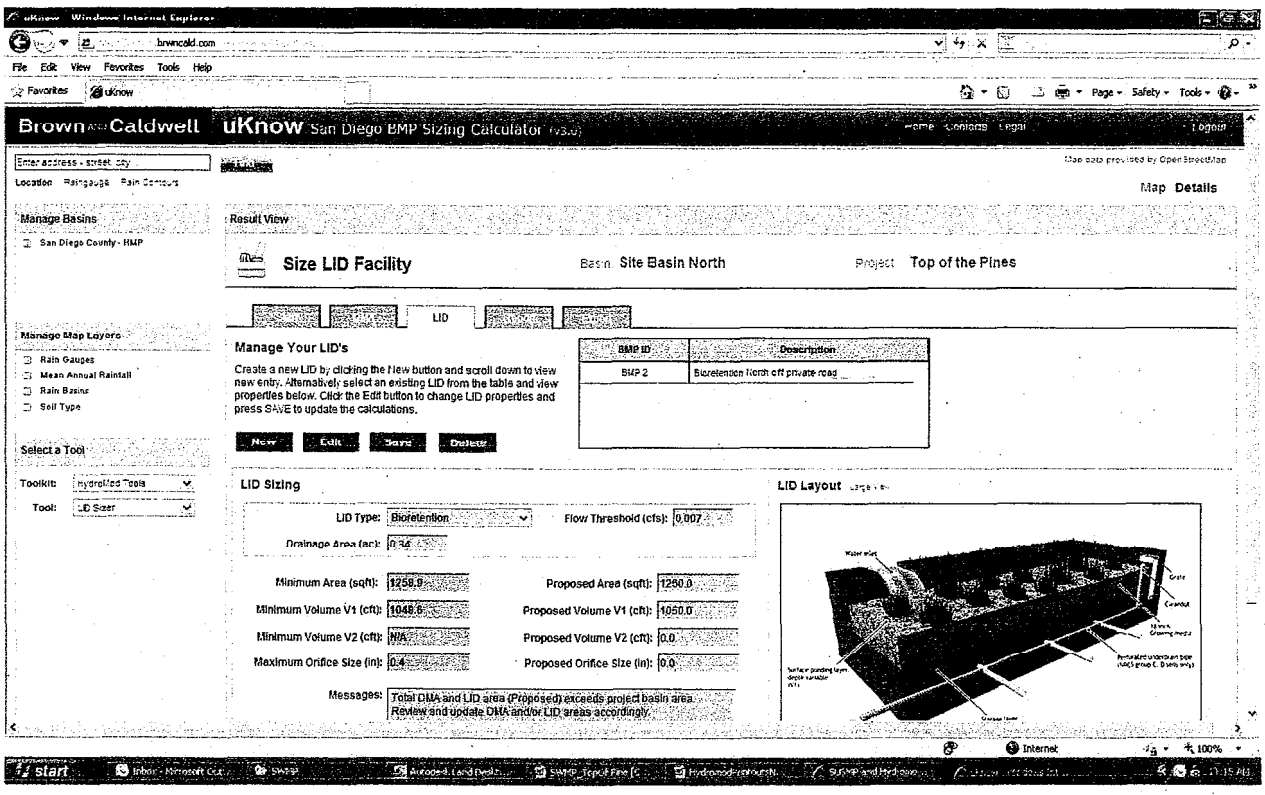
Done

Internet 100%

Start | Autodesk Land ... | Inbox - Microsof... | A1-1_SITE A1 (... | CountyCommen... | SUSMP and Hyd... | uKnow - Windo... | TopPine | Fitzmaurice Con... | Document1 - Mic... | 11:16 AM


uKnow - Windows Internet Explorer
bmncald.com
File Edit View Favorites Tools Help
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5940
DMA 9
5941
DMA 10
5942
DMA 11
5943
DMA 12
DMA Type: Self-Treating
Drainage Area (ac): 1.39
BMP ID:
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover:
Post Surface:
Pre-Project Slope:
Messages:
Large View
Done
Internet
100%
start


uKnow - Windows Internet Explorer
bmncald.com
File Edit View Favorites Tools Help
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
New
Edit
Save
Delete
DMA ID
Description
5940
DMA 9
5941
DMA 10
5942
DMA 11
5943
DMA 12
DMA Type: Self-Treating
Drainage Area (ac): 0.16
BMP ID:
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover:
Post Surface:
Pre-Project Slope:
Messages:
Large View
Done
Internet
100%
start


Brown AND Caldwell
uKnow San Diego BMP Sizing Calculator
Manage Basins
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Result View
Size LID Facility
Basin Site Basin North
Project Top of the Pines
LID
Manage Your LID's
Create a new LID by clicking the New button and scroll down to view new entry. Alternatively select an existing LID from the table and view properties below. Click the Edit button to change LID properties and press SAVE to update the calculations.
New
Edit
Save
Delete
BMP ID
Description
BMP 2
Bioretention North off private road
LID Sizing
LID Type: Bioretention
Flow Threshold (cfs): 0.007
Drainage Area (ac): 0.34
Minimum Area (sqft): 1258.0
Proposed Area (sqft): 1260.0
Minimum Volume V1 (cft): 1048.6
Proposed Volume V1 (cft): 1050.0
Minimum Volume V2 (cft): N/A
Proposed Volume V2 (cft): 0.0
Maximum Orifice Size (in): 0.4
Proposed Orifice Size (in): 0.0
Messages: Total DMA and LID area (Proposed) exceeds project basin area. Review and update DMA and/or LID areas accordingly.
LID Layout

Project Summary

Project Name	Top of the Pines
Project Applicant	One Pac Company
Jurisdiction	County of San Diego
Parcel (APN)	410-030-17
Hydrologic Unit	Tijuana

Compliance Basin Summary

Basin Name:	Site TOTP Lane North
Receiving Water	TOTP Lane At North PL
Rainfall Basin	Lake Wohlford
Mean Annual Precipitation (inches)	20.0
Project Basin Area (acres):	0.41
Watershed Area (acres):	0.41
SCCWRP Lateral Channel Susceptiblity (H, M, L):	
SCCWRP Vertifical Channel Susceptiblity (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

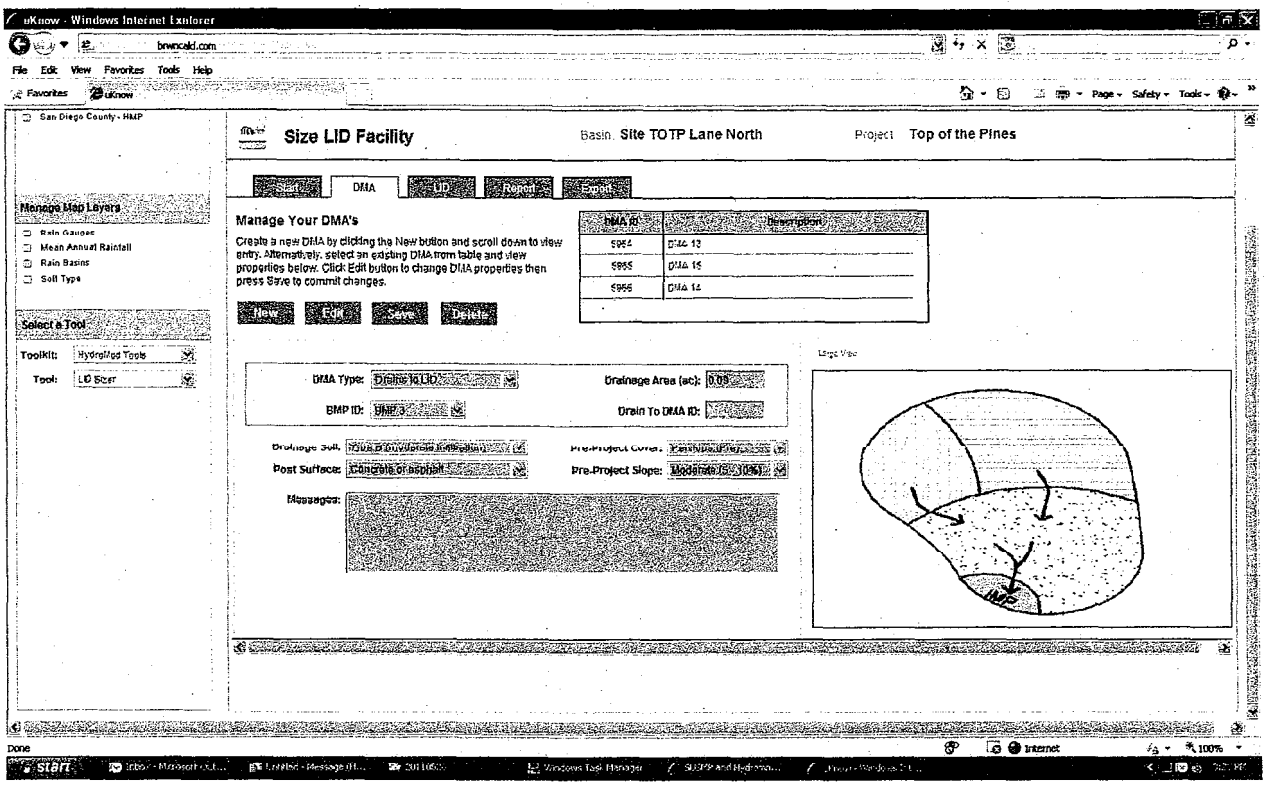
Drainage Management Area Summary

ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
5964	Drains to LID	BMP 3	DMA 13	0.09	Pervious (Pre	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)
5965	Self-Treating	BMP 3	DMA 15	0.26	Pervious (Pre	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)
5966	Drains to LID	BMP 3	DMA 14	0.06	Impervious (Pre	Concrete or asphalt	Type B (moderate infiltration)	Moderate (5 - 10%)

LID Facility Summary

BMP ID	Type	Description	Plan Area (sqf)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 3	Bioretention	Bioretention TOTP Lane at PL	333	277	0.00	0.005	0.3

TOP OF THE PINE LANE BASIN, BMP 3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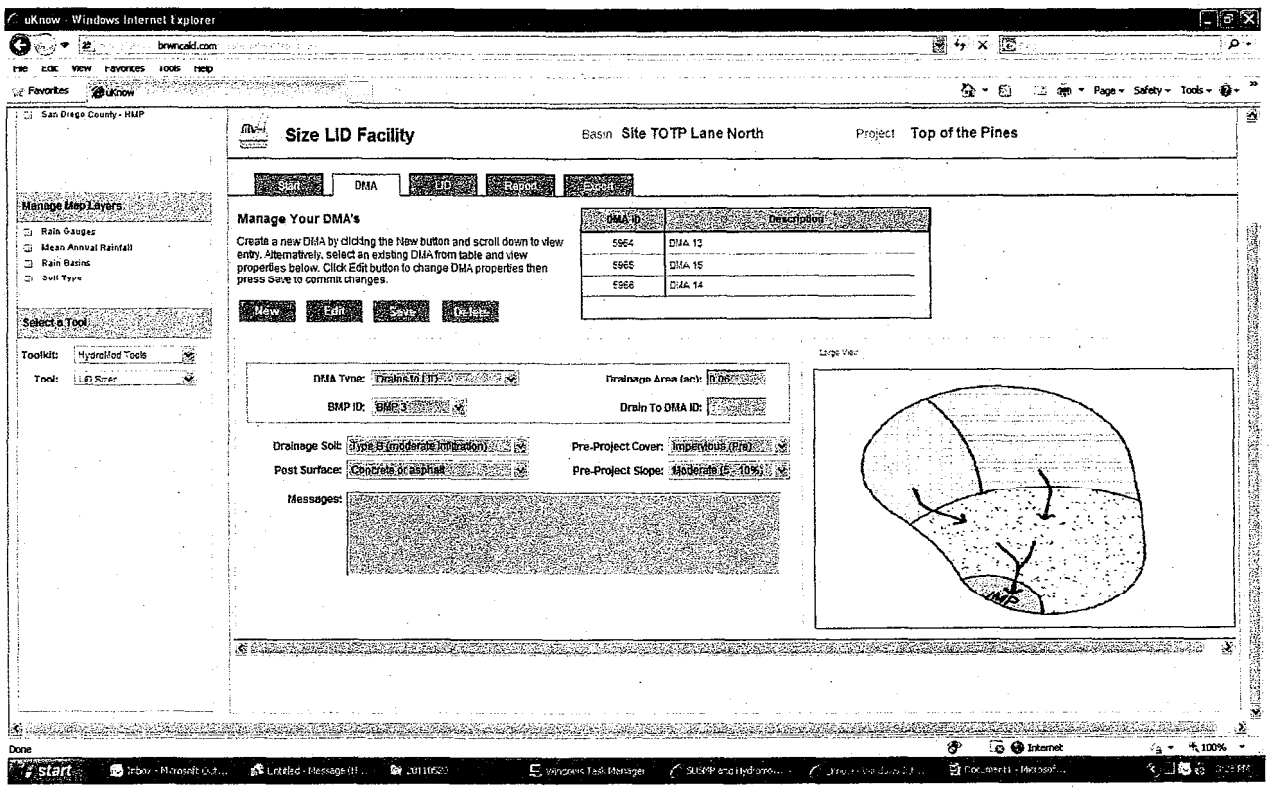
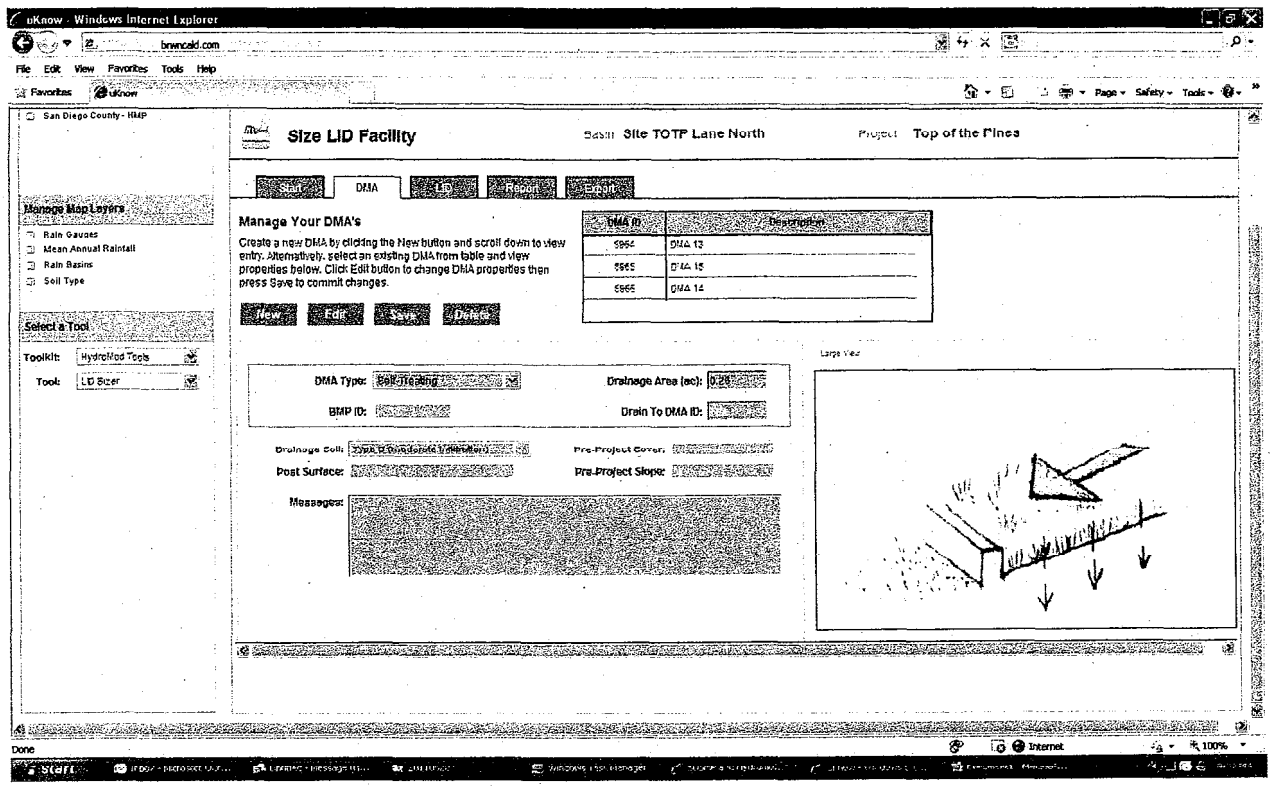
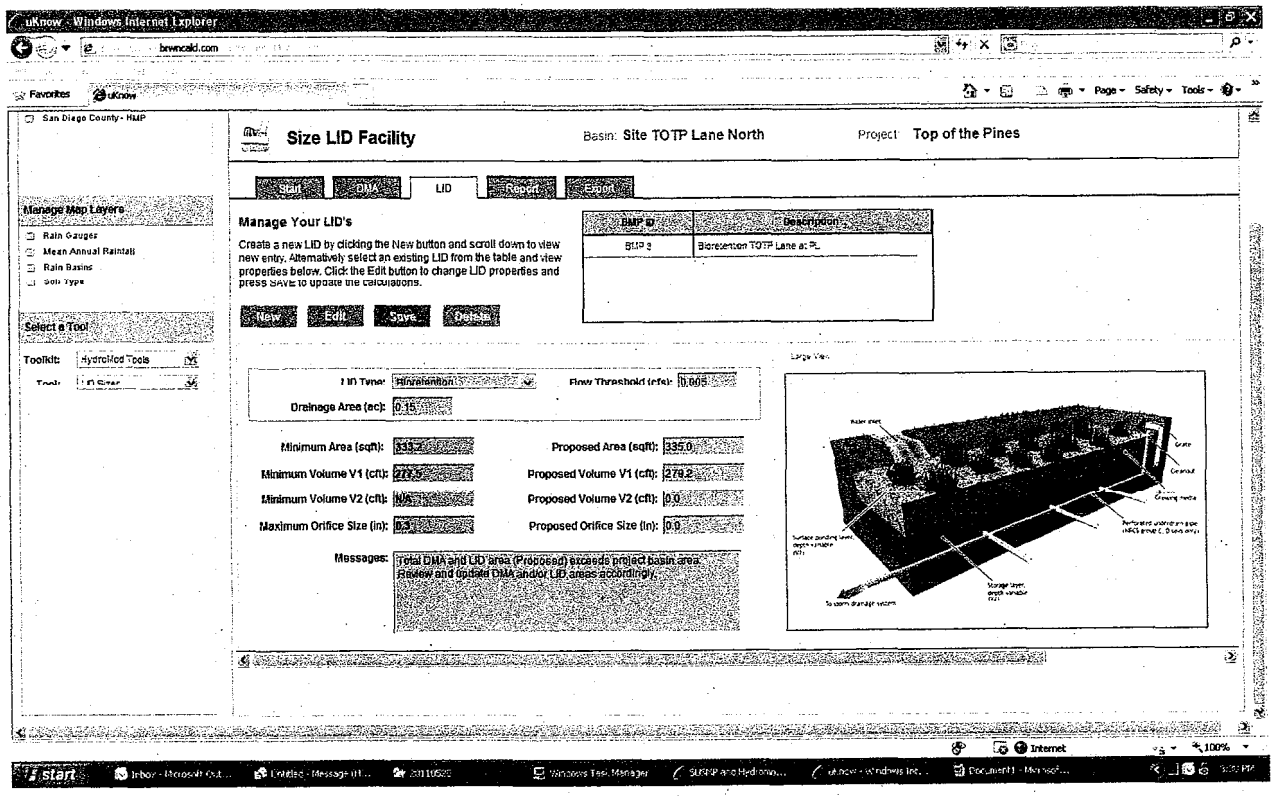
brwncald.com
File Edit View Favorites Tools Help
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site TOTP Lane North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5964
DMA 13
5965
DMA 15
5966
DMA 14
New
Edit
Save
Delete
DMA Type: Drains to LID
Drainage Area (ac): 0.09
BMP ID: BMP 3
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Impervious (Pre)
Post Surface: Concrete or asphalt
Pre-Project Slope: Moderate (5 - 10%)
Messages:
Large View
BMP
Done
Internet
100%
start


uKnow - Windows Internet Explorer
brwncald.com
File Edit View Favorites Tools Help
Favorites uKnow
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site TOTP Lane North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5964
DMA 13
5965
DMA 15
5966
DMA 14
New
Edit
Save
Delete
DMA Type: Drains to LID
Drainage Area (ac): 0.09
BMP ID: BMP 3
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Impervious (Pre)
Post Surface: Concrete or asphalt
Pre-Project Slope: Moderate (5 - 10%)
Messages:
Large View
BMP
Done
Internet
100%
start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
San Diego County - HMP
Size LID Facility
Basin: Site TOTP Lane North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5964
DMA 13
5965
DMA 15
5966
DMA 14
New
Edit
Save
Delete
DMA Type: Self-Treating
Drainage Area (ac): 0.26
BMP ID:
Drain To DMA ID:
Drainage Soil: Type D (Conditions Undefined)
Pre-Project Cover:
Post Surface:
Pre-Project Slope:
Messages:
Large View
Done
Internet
100%


uKnow - Windows Internet Explorer
San Diego County - HMP
Size LID Facility
Basin: Site TOTP Lane North
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Manage Your LID's
Create a new LID by clicking the New button and scroll down to view new entry. Alternatively select an existing LID from the table and view properties below. Click the Edit button to change LID properties and press Save to update the calculations.
BMP ID
Description
BMP 9
Bioretention TOTP Lane at PL
New
Edit
Save
Delete
LID Type: Bioretention
Flow Threshold (cfs): 0.005
Drainage Area (ac): 0.15
Minimum Area (sqft):
Proposed Area (sqft): 335.0
Minimum Volume V1 (cft):
Proposed Volume V1 (cft): 279.2
Minimum Volume V2 (cft):
Proposed Volume V2 (cft): 0.0
Maximum Orifice Size (in):
Proposed Orifice Size (in): 0.0
Messages: Total DMA and LID area (Proposed) exceeds project basin area. Review and update DMA and/or LID areas accordingly.
Large View
Internet
100%

Project Summary

Project Name	Top of the Fines
Project Applicant	One Pac Company
Jurisdiction	County of San Diego
Parcel (APN)	410-030-17
Hydrologic Unit	Tijuana

Compliance Basin Summary

Basin Name:	Site Basin NorthEast
Receiving Water:	NE property line
Rainfall Basin	Lake Wohlford
Mean Annual Precipitation (inches)	20.0
Project Basin Area (acres):	0.27
Watershed Area (acres):	0.27
SCCWRP Lateral Channel Susceptiblity (H, M, L):	
SCCWRP Vertifical Channel Susceptiblity (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

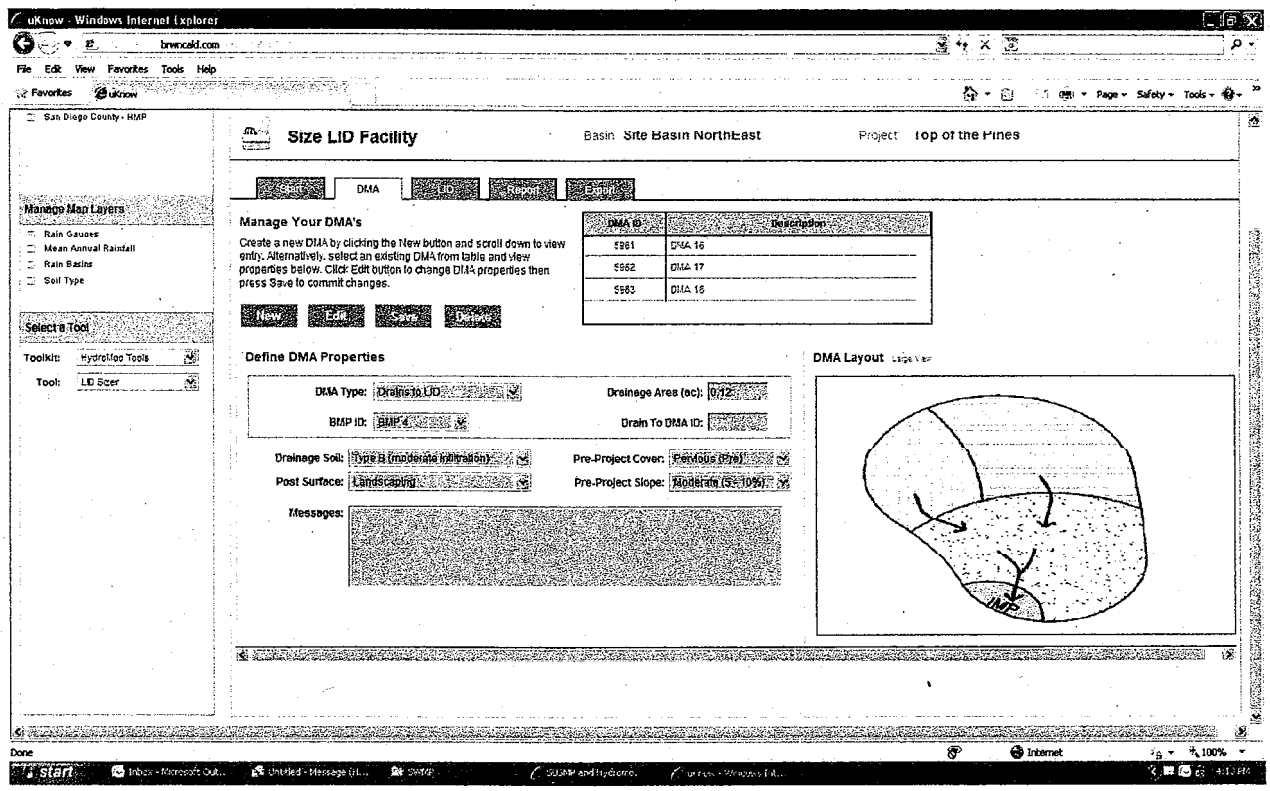
NORTH/EAST BASIN, BMP 4

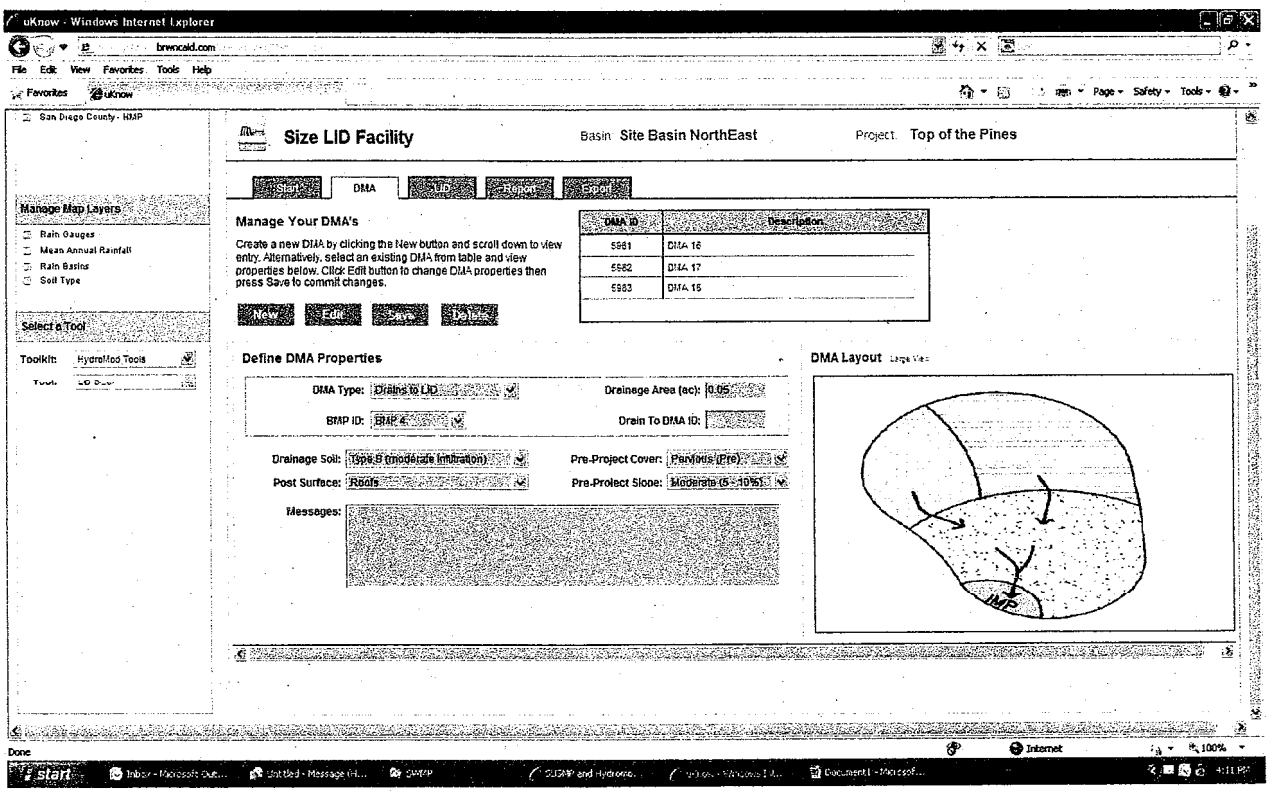
Drainage Management Area Summary

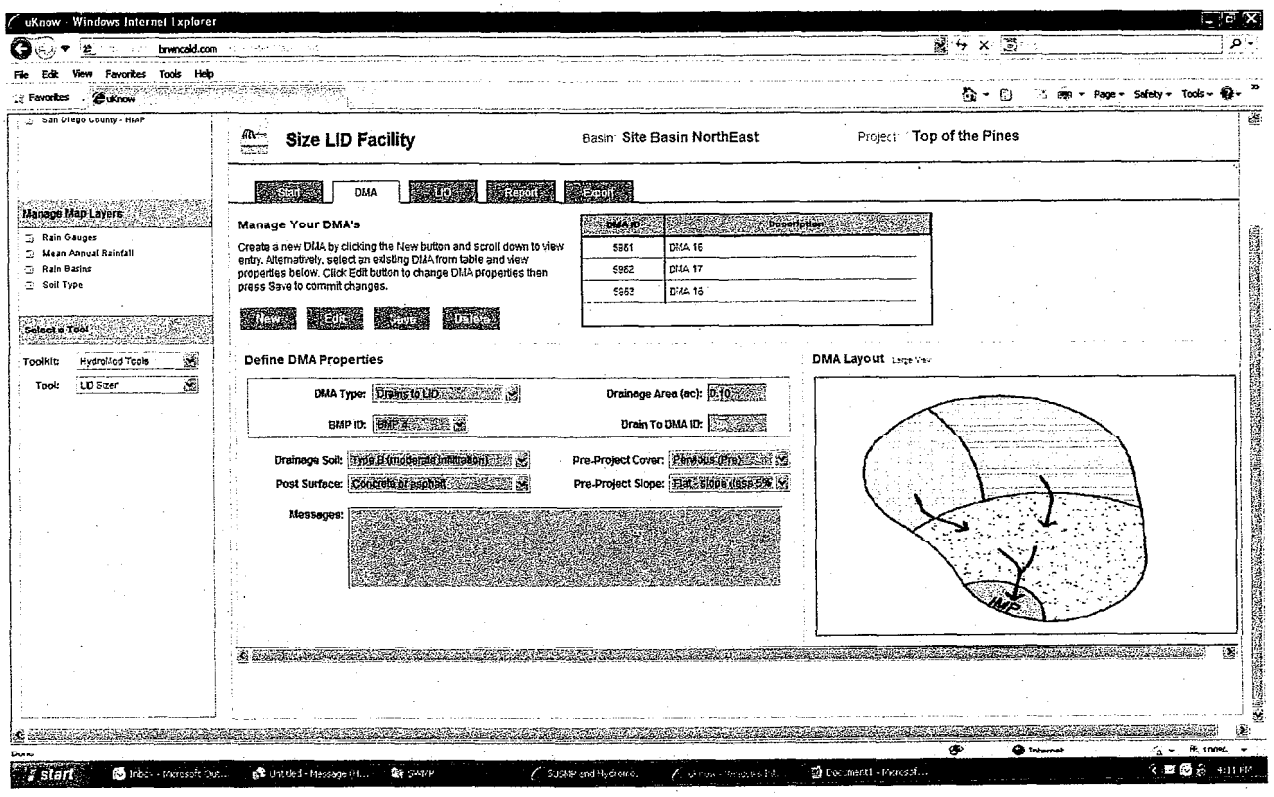
ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
5981	Drains to LID	BMP 4	DMA 16	0.12	Pervious (Pre)	Landscaping	Type B (moderate infiltration)	Moderate (5 - 10%)
5982	Drains to LID	BMP 4	DMA 17	0.05	Pervious (Pre)	Roofs	Type B (moderate infiltration)	Moderate (5 - 10%)
5983	Drains to LID	BMP 4	DMA 18	0.10	Pervious (Pre)	Concrete or asphalt	Type B (moderate infiltration)	Flat - slope (less ..

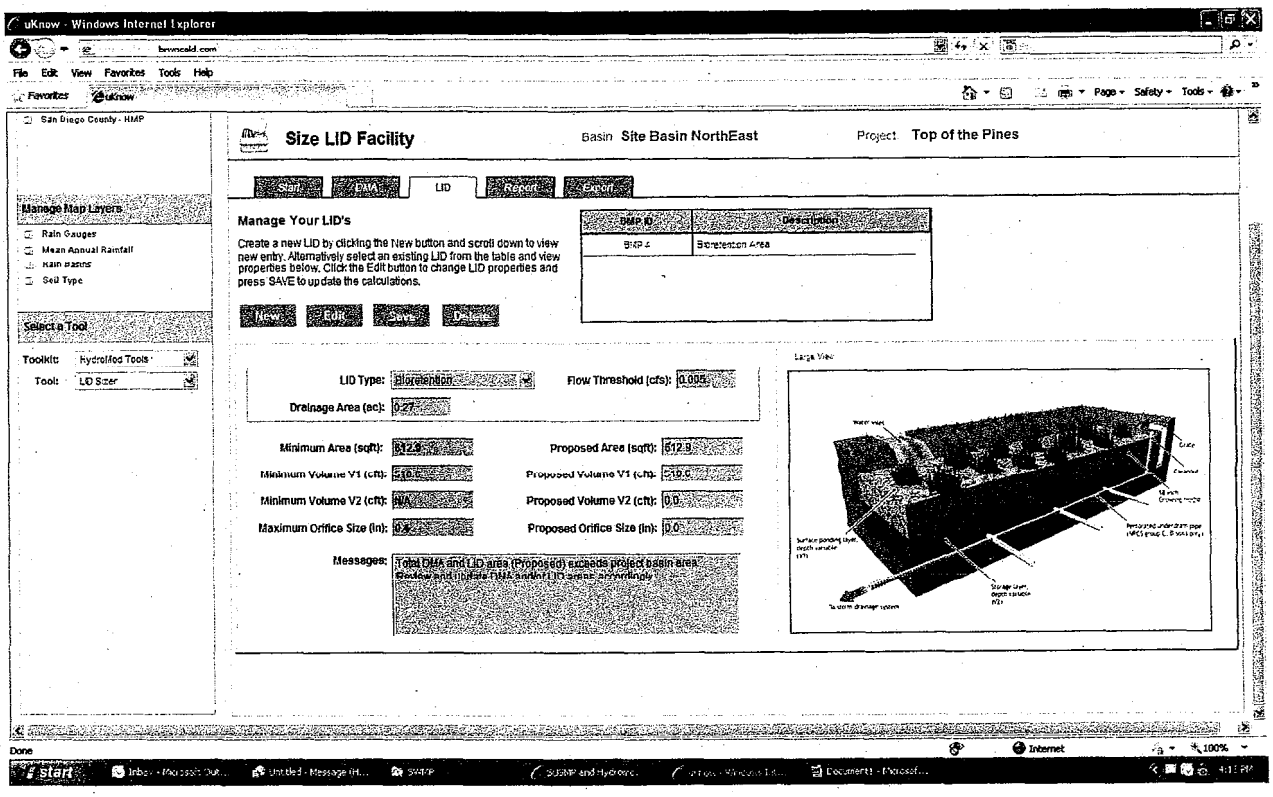
LID Facility Summary

BMP ID	Type	Description	Plan Area (scft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 4	Bioretention	Bioretention Area	612	510	0.00	0.005	0.4


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
San Diego County - HMP
Size LID Facility
Basin Site Basin NorthEast
Project Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5981
DMA 16
5982
DMA 17
5983
DMA 18
New
Edit
Save
Delete
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.12
BMP ID: BMP 4
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Landscaping
Pre-Project Slope: Moderate (5 - 10%)
Messages:
DMA Layout
JMP
Done
Internet
start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
San Diego County - HMP
Size LID Facility
Basin Site Basin NorthEast
Project Top of the Pines
Start
DMA
LID
Report
Export
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5981
DMA 16
5982
DMA 17
5983
DMA 18
New
Edit
Save
Delete
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 4
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Roofs
Pre-Project Slope: Moderate (5 - 10%)
Messages:
DMA Layout
JMP
Done
Internet
start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin NorthEast
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5861
DMA 16
5862
DMA 17
5863
DMA 18
New
Edit
Save
Delete
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.10
BMP ID: BMP 2
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Fair)
Post Surface: Concrete or asphalt
Pre-Project Slope: Flat: 2 slope (less 5%)
Messages:
DMA Layout
BMP
Done
Internet
start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Size LID Facility
Basin: Site Basin NorthEast
Project: Top of the Pines
Start
DMA
LID
Report
Export
Manage Your LID's
Create a new LID by clicking the New button and scroll down to view new entry. Alternatively select an existing LID from the table and view properties below. Click the Edit button to change LID properties and press SAVE to update the calculations.
BMP ID
Description
BMP 2
Bioretention Area
New
Edit
Save
Delete
LID Type: Bioretention
Flow Threshold (cfs): 0.005
Drainage Area (ac): 0.27
Minimum Area (sqft): 512.9
Proposed Area (sqft): 512.9
Minimum Volume V1 (cft): 516.1
Proposed Volume V1 (cft): 516.0
Minimum Volume V2 (cft): N/A
Proposed Volume V2 (cft): 0.0
Maximum Orifice Size (in): 0.3
Proposed Orifice Size (in): 0.0
Messages:
Total DMA and LID area (Proposed) exceeds project basin area.
Done
Internet
start

Project Summary

Project Name	Top of the Pines
Project Applicant	One Pac Company
Jurisdiction	County of San Diego
Parcel (APN)	410-030-17
Hydrologic Unit	Tijuana

Compliance Basin Summary

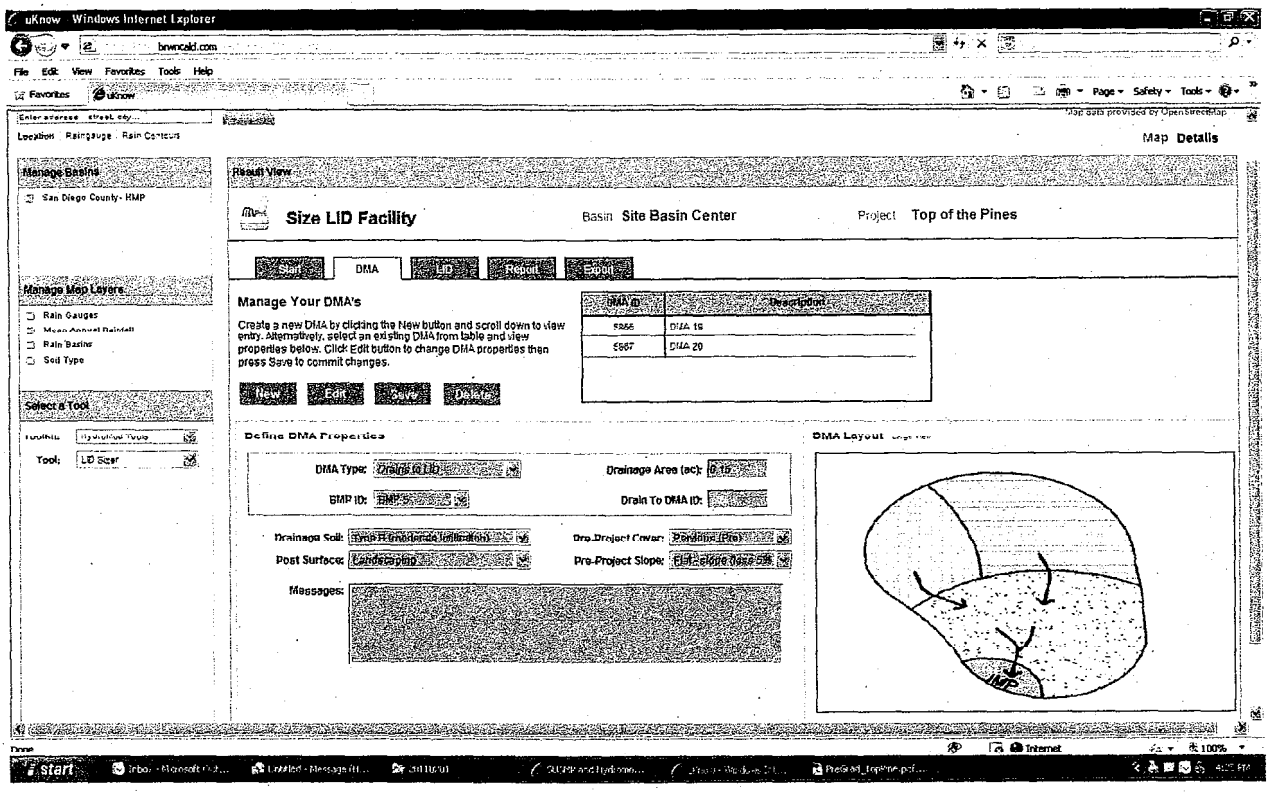
Basin Name:	Site Basin Center
Receiving Water:	Off Parcel 2 Pad
Rainfall Basin	Lake Wohlford
Mean Annual Precipitation (inches)	20.0
Project Basin Area (acres):	0.20
Watershed Area (acres):	0.20
SCCWRP Lateral Channel Susceptiblity (H, M, L):	
SCCWRP Vertifical Channel Susceptiblity (H, M, L):	
Overall Channel Susceptibility (H, M, L):	HIGH
Lower Flow Threshold (% of 2-Year Flow):	0.1

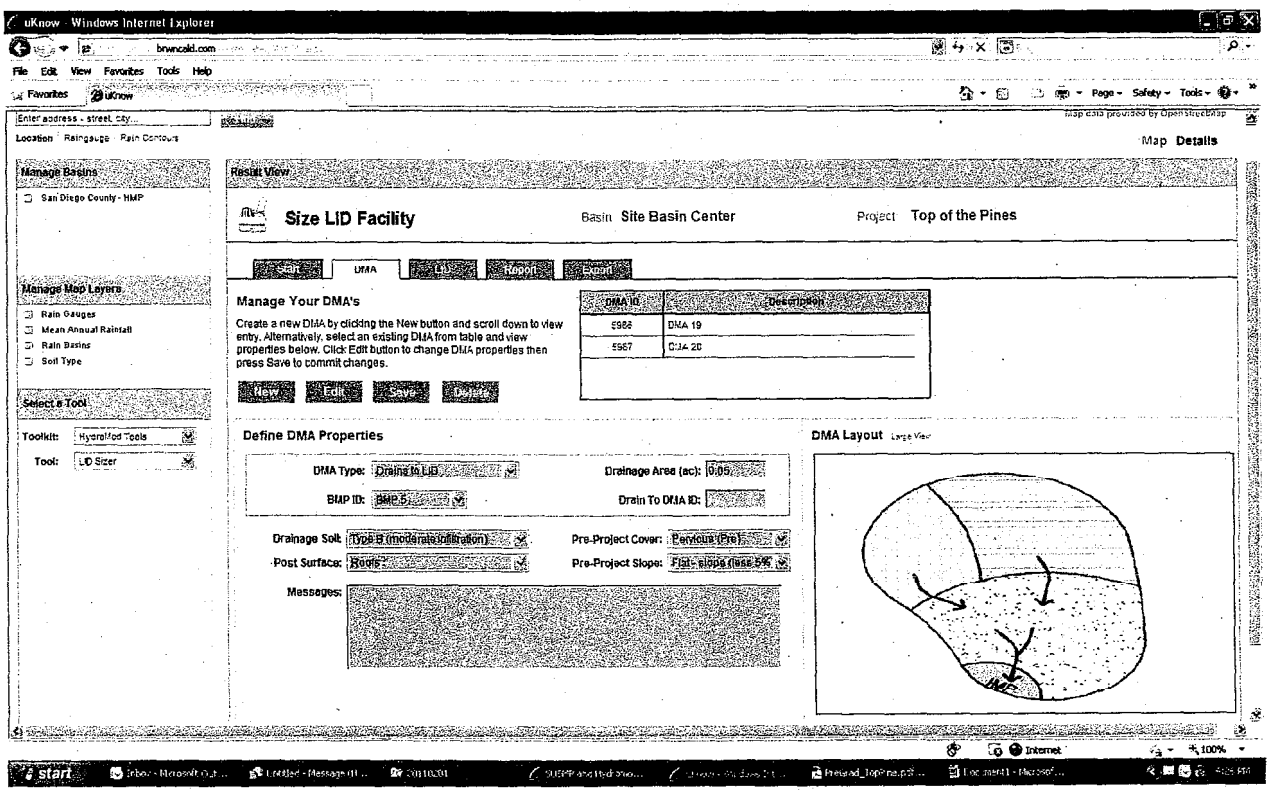
Drainage Management Area Summary

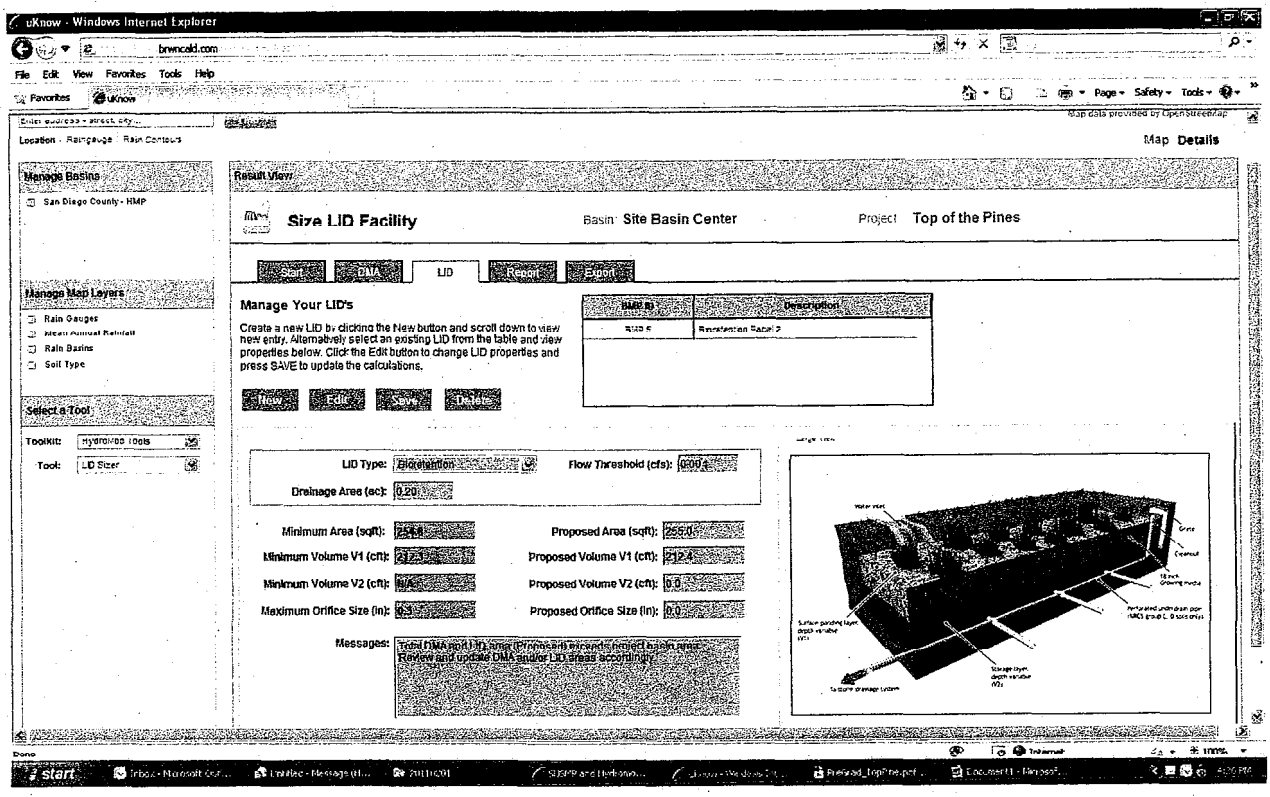
ID	Type	BMP ID	Description	Area (ac)	Pre-Project Cover	Post Surface Type	Drainage Soil	Slope
5986	Drains to LID	BMP 5	DMA 19	0.15	Pervious (Pre	Landscaping	Type B (moderate infiltration)	Flat - slope (less ...
5987	Drains to LID	BMP 5	DMA 20	0.05	Pervious (Pre	Roofs	Type B (moderate infiltration)	Flat - slope (less ...

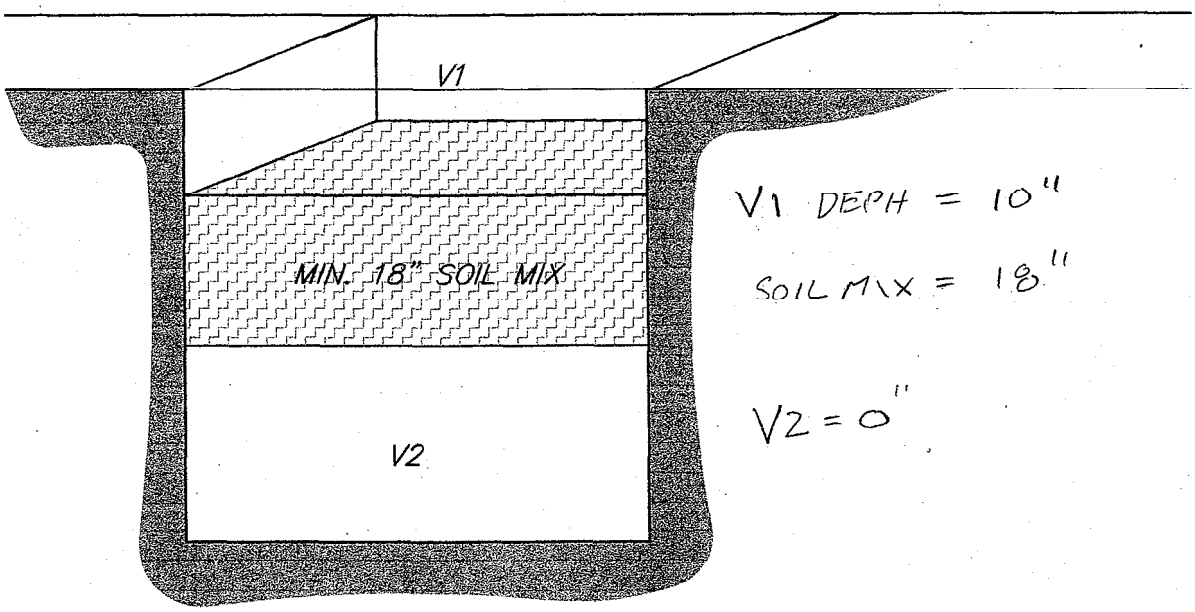
LID Facility Summary

BMP ID	Type	Description	Plan Area (sqft)	Volume 1(cft)	Volume 2(cft)	Orifice Flow (cfs)	Orifice Size (inch)
BMP 5	Bioretention	Bioretention Pacel 2	254	212	0.00	0.004	0.3


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
Favorites uKnow
Location Raingauge Rain Contours
Map Details
Manage Basins
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Result View
Size LID Facility
Basin Site Basin Center
Project Top of the Pines
Start
DMA
LID
Report
Export
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5966
DMA 19
5967
DMA 20
New
Edit
Save
Delete
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.15
BMP ID: BMP 5
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Landscaping
Pre-Project Slope: Flat - slope (less 5%
Messages:
DMA Layout
Internet
100%
Start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
Favorites uKnow
Location Raingauge Rain Contours
Map Details
Manage Basins
San Diego County - HMP
Manage Map Layers
Rain Gauges
Mean Annual Rainfall
Rain Basins
Soil Type
Select a Tool
Toolkit: HydroMod Tools
Tool: LID Sizer
Result View
Size LID Facility
Basin Site Basin Center
Project Top of the Pines
Manage Your DMA's
Create a new DMA by clicking the New button and scroll down to view entry. Alternatively, select an existing DMA from table and view properties below. Click Edit button to change DMA properties then press Save to commit changes.
DMA ID
Description
5966
DMA 19
5967
DMA 20
New
Edit
Save
Define DMA Properties
DMA Type: Drains to LID
Drainage Area (ac): 0.05
BMP ID: BMP 5
Drain To DMA ID:
Drainage Soil: Type B (moderate infiltration)
Pre-Project Cover: Pervious (Pre)
Post Surface: Roofs
Pre-Project Slope: Flat - slope (less 5%
Messages:
DMA Layout
Internet
100%
start


uKnow - Windows Internet Explorer
File Edit View Favorites Tools Help
Map Details
Manage Basins
San Diego County - HMP
Manage Map Layers
Rain Gauges
Rain Basins
Soil Type
Select a Tool
Toolkit:
Tool:
LID Sizer
Result View
Size LID Facility
Basin: Site Basin Center
Project: Top of the Pines
Site
DMA
LID
Report
Export
Manage Your LID's
Create a new LID by clicking the New button and scroll down to view new entry. Alternatively select an existing LID from the table and view properties below. Click the Edit button to change LID properties and press SAVE to update the calculations.
LID ID
Description
New
Edit
Save
Delete
LID Type:
Flow Threshold (cfs):
Drainage Area (ac):
Minimum Area (sqft):
Proposed Area (sqft):
Minimum Volume V1 (cft):
Proposed Volume V1 (cft):
Minimum Volume V2 (cft):
Proposed Volume V2 (cft):
Maximum Orifice Size (in):
Proposed Orifice Size (in):
Messages:
Review and update DMA and/or LID areas accordingly.



V1 DEPH = 10"

SOIL MIX = 18"

V2 = 0"

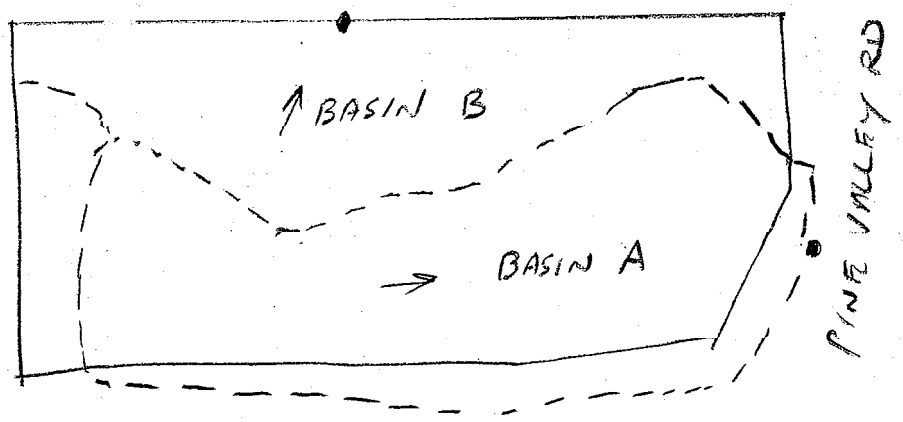
BIORENTION SECTION

NOT TO SCALE

TOP OF THE PINES HYDROLOGY (PRE-DEV)

1. DETERMINE RUNOFF FROM BASINS

$Q = CIA$



BASIN A, AREA = 552,589 SF ⇒ 12.69 AC

C = 0.25 "SOIL TYPE B"

$I_{10} = 7.44 \times P_6 D^{-0.645}$ ← T_C

$T_C = T_i + T_t$ (INNITIAL + TRAVEL)

T_i ⇒ 10% SLOPE FOR 100' ⇒ 6.9 MINUTES

T_t ⇒ LENTH = 1,235' ⇒ 0.22 MILES // ΔE = 3771.7 − 3390.0 = 136.3

$$T_C = \left(\frac{11.9 L^3}{\Delta E}\right)^{0.385} = \left(\frac{11.9(0.22)^3}{136.3'}\right)^{.385}$$

$T_C = 0.068 \ (60) = 4.05$ MINUTS

$T = 6.9_{MIN} + 4.1_{MIN} = 11.0$ MN

$I_{10} = 7.44 \times 3.0 (11.0)^{-.645} = 4.75$ IN/HR

$Q_{A10} = 0.25(4.75)(12.69\ AC)$

$$\boxed{Q_{A10} = 15.07 \text{ CFS}}$$

BASIN B (STEEPER)

$AREA_B = 254,914\ SF = 5.85\ AC$

$C = 0.25$

$T_C = T_i + T_t$

T_i = 10% SLOPE FOR 100' = 6.9 MINUTES

T_t = LENGTH 359'

T_t = ~1.0 MINUTE

$T_C = 6.9\ MN + 1.0\ MN = 7.9\ MN.$

$I = 7.44 \times 3.0 (7.9)^{-.645} = 5.88\ IN/HR$

$Q_{B10} = 0.25(5.88)(5.85)$

$\boxed{Q_{B10} = 8.60\ CFS}$

2. DETERMIN WATER QUALITY FLOWS IN BASINS

$Q_{WQ} = C\ I_{WQ}\ A$ (BASED ON 85TH PERCENTILE STORM)

USE INTENSITY (I) = 0.2 IN/HR (COUNTY STD.)

BASIN A (USE POST DEVELOPMENT CALCULATIONS)

$C = 0.32, \quad A = 12.69\ AC$

$Q_{AWQ} = 0.32(0.2\ IN/HR)(12.69\ AC)$

$\boxed{Q_{AWQ} = 0.812\ CFS}$

BASIN B $C_B = 0.32, \quad A = 5.85\ AC$

$Q_{BWQ} = 0.32(0.2\ IN/HR)(5.85\ AC)$

$\boxed{Q_{BWQ} = 0.37\ CFS}$

TOD OF THE PINES (POST-DEV)

3. DETERMINE RUNOFF POST DEVELOPMENT

$C = 0.32$ (1.0 DU/ACRE) TABLE 3-1

BASIN A

$A = 12.69$ ACRE

$I = 4.75$ (INTENSITY NOT AFFECTED BY DEVELOPMENT FLOW LINE SAME)

$Q_{A10} = 0.32(4.75)(12.69)$

$\boxed{Q_{A10} = 19.29 \text{ CFS}}$

BASIN B

$C = 0.32$ (TABLE 3-1)

$A = 5.85$ AC

$I = 5.98$ (FLOW-LINE SAME)

$Q_{B10} = 0.32(5.98)(5.85 \text{ AC})$

$\boxed{Q_{B10} = 11.0 \text{ CFS}}$

SUB BASIN HYDROLOGY Q DRE

1. WEST BASIN AREA = 1.7 AC, T = 5 min

$I_5 = 7.90$, $C = 0.25$

$Q_{WEST} = 0.25(7.90)(1.2\,AC) = 2.37\,CFS$

2. NORTH BASIN AREA = 1.89 AC

$Q_{NORTH} = 0.25(7.90)(1.89) = 3.73\,CFS$

3. TOP LANE BASIN, AREA = 0.41 AC

$Q_T = 0.25(7.90)(0.41) = 0.81\,CFS$

4. NORTHEAST BASIN AREA = 0.27 AC

$Q_{NE} = 0.25(7.90)(0.27) = 0.53\,CFS$

5. CENTER BASIN AREA 0.20 AC

$Q_C = 0.25(7.90)(0.20) = 0.40\,CFS$

OBTAIN % IMPERVIOUS NEW & Qpost

1. WEST 0.34 AC Imp, $\frac{0.34}{1.20} = 0.28\,\%$, $C = .28(90) + .72(.25)$

$C = 0.43$

$Q_W = .43(7.9)(1.2) = \boxed{4.07\,CFS}$

2. NORTH 0.34 AC Imp $\frac{0.34}{1.89\,AC} = 18\,\%$, $C = .18(90) + .82(.25)$

$C = 0.37$

$Q_N = 0.37(7.9)(1.89) = \boxed{5.52\,CFS}$

3 TOTH 0.09 AC Imp $\frac{0.09}{0.41} = 0.22$, $C = .22(90) + .78(.25)$

$C = 0.39$

$Q_T = 0.39(7.9)(0.41) = \boxed{1.26\,CFS}$

4. NE 0.15 AC Imp $\frac{0.15}{0.27} = 0.56$ $C = 0.56(.90) + 0.45(.25)$

$C = .6165 \approx .62$

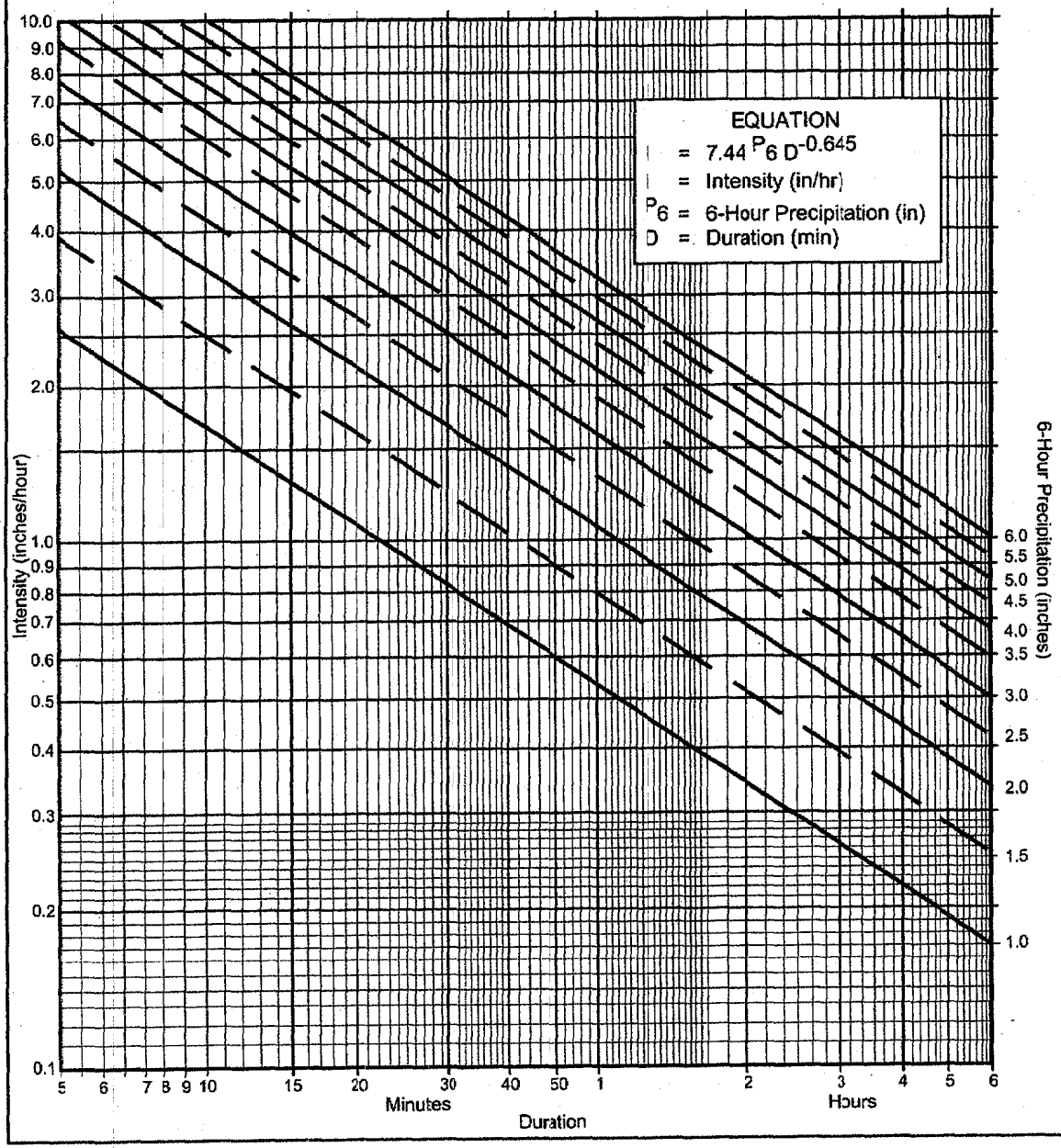
$Q_4 = 0.62(7.9)(0.27) = \boxed{1.32 \text{ CFS}}$

5. CENTR 0.05 AC Imp $\frac{.05}{.20} = .25$ $C = .25(.90) + .75(.25)$

$C = 0.41$

$Q_5 = .41(7.9)(0.20) = \boxed{0.65 \text{ CFS}}$

TOP OF THE PINES



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 10 year

(b) P_6 = 3.0 in., P_{24} = _____, $\frac{P_6}{P_{24}}$ = _____ %(2)

(c) Adjusted P_6(2) = 3.0 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

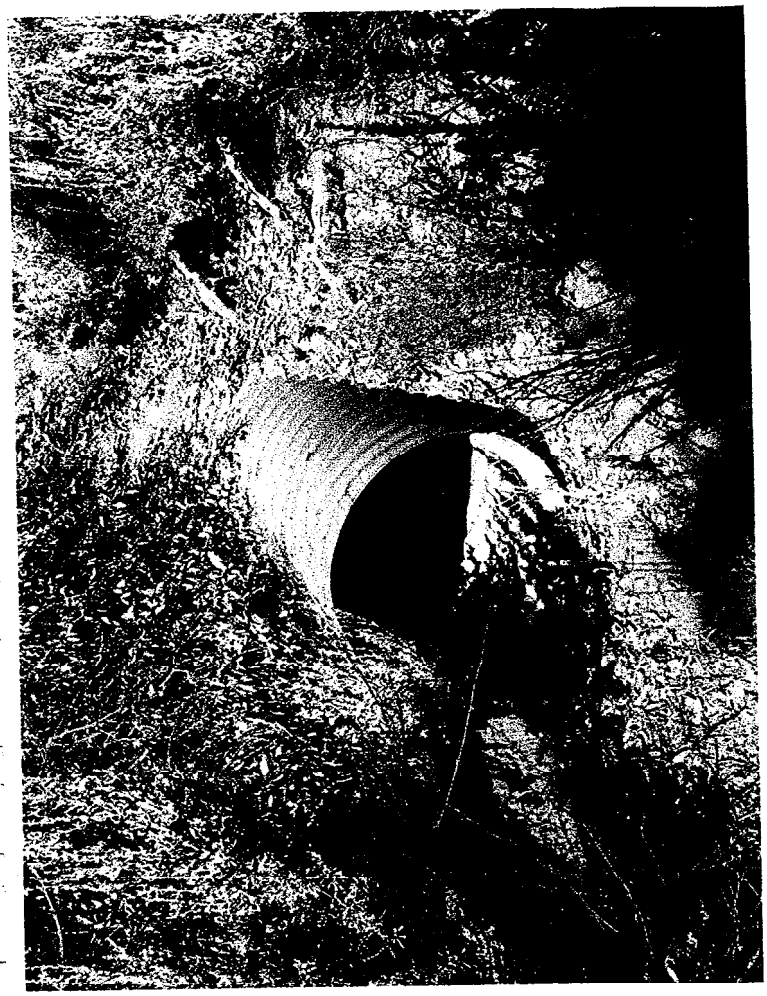
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6 / Duration	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Tim 5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
350	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

A12



REGION	WATER BODY NAME	CALWATER NUMBER	INTEGRATED REPORT CATEGORY	DECISION ID	DECISION REVISION STATUS	POLLUTANT	DECISION LISTING YEAR	FINAL LISTING DECISION	EXPECTED TMDL COMPLETION DATE
9	Paleta Creek	90831000	5	16904	Revised	Cadmium	2008	Do Not List or 303(d) list (TMDL required list)	
9	Paleta Creek	90831000	5	16907	Revised	Chromium (total)	2008	Do Not List or 303(d) list (TMDL required list)	
9	Paleta Creek	90831000	5	16909	Revised	Copper	2008	List on 303(d) list (TMDL required list)	01-Jan-2021
9	Paleta Creek	90831000	5	16910	Revised	Lead	2008	List on 303(d) list (TMDL required list)	01-Jan-2021
9	Paleta Creek	90831000	5	16911	Revised	Nickel	2008	Do Not List or 303(d) list (TMDL required list)	
9	Paleta Creek	90831000	5	16912	Revised	Selenium	2008	Do Not List or 303(d) list (TMDL required list)	
9	Paleta Creek	90831000	5	16913	Revised	Silver	2008	Do Not List or 303(d) list (TMDL required list)	
9	Paleta Creek	90831000	5	16914	Revised	Zinc	2008	Do Not List on 303(d) list (TMDL required list)	
9	Paradise Creek, HSA 908.320	90912000	3	16949	Revised	Phosphorus	2008	Do Not List on 303(d) list (TMDL required list)	
9	Paradise Creek, HSA 908.320	90912000	3	16950	Revised	Selenium	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pauma Creek	90322000	3	16951	Revised	Benthic Community Effects	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	17902	Revised	Benthic Community Effects	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	7379	Revised	Enterococcus	2008	Delist from 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	5222	Original	Nitrite	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	5219	Original	Oxygen, Dissolved	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	5176	Revised	Phosphorus	2008	Delist from 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	5221	Original	Total Dissolved Solids	2008	Do Not List on 303(d) list (TMDL required list)	
9	Pine Valley Creek (Upper)	9?141000	5	5193	Original	Turbidity	2008	List on 303(d) list (TMDL required list)	01-Jan-2019
9	Pine Valley Creek (Upper)	9?141000	5	5220	Original	pH	2008	Do Not List on 303(d) list (TMDL required list)	
9	Poggi Canyon Creek	9?020000	5	5396	Original	DDT (Dichlorodiphenyltrichloroethane)	2008	List on 303(d) list (TMDL required list)	01-Jan-2019

ATTACHMENT E

Geotechnical Certification Sheet

(if applicable)

The design of stormwater treatment and other control measures proposed in this plan requiring specific soil infiltration characteristics and/or geological conditions has been reviewed and approved by a registered Civil Engineer, Geotechnical Engineer, or Geologist in the State of California.

_____ _____

Name and registration # Date

ATTACHMENT F

Maintenance Plan

(Use Chapter 5 of the SUSMP as guidance in developing your Maintenance Plan)

The following is a general outline to create your project specific Maintenance Plan.

I. Inspection, Maintenance Log and Self-Verification Forms (Examples are provided in Appendix F of the San Diego County SUSMP)

II. Updates, Revisions and Errata

III. Introduction

A. Narrative overview describing the site; drainage areas, routing, and discharge points; and treatment facilities.

IV. Responsibility for Maintenance

A. General

(1) Name and contact information for responsible individual(s).

(2) Organization chart or charts showing organization of the maintenance function and location within the overall organization.

(3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.

(4) Maintenance Funding

(1) Sources of funds for maintenance

(2) Budget category or line item

(3) Description of procedure and process for ensuring adequate funding for maintenance

B. Staff Training Program

C. Records

D. Safety

V. Summary of Drainage Areas and Stormwater Facilities

A. Drainage Areas

(1) Drawings showing pervious and impervious areas (copied or adapted from initial SWMP).

(2) Designation and description of each drainage area and how flow is routed to the corresponding facility.

B. Treatment and Flow-Control Facilities

(1) Drawings showing location and type of each facility

(2) General description of each facility (Consider a table if more than two facilities)

(1) Area drained and routing of discharge.

(2) Facility type and size

VI. Facility Documentation

A. "As-built" drawings of each facility (design drawings in the draft Plan)

B. Manufacturer's data, manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a "placeholder" in the draft plan for information not yet available).

C. Specific operation and maintenance concerns and troubleshooting

VII. Maintenance Schedule or Matrix

A. Maintenance Schedule for each facility with specific requirements for:

(1) Routine inspection and maintenance

(2) Annual inspection and maintenance

(3) Inspection and maintenance after major storms

B. Service Agreement Information

Assemble and make copies of your maintenance plan. One copy must be submitted to the County, and at least one copy kept on-site. Here are some suggestions for formatting the maintenance plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling.
- Include the revision date in the footer on each page.
- Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed-up so that copies of the maintenance plan can be made if the hard copy is lost or damaged.

Top of the Pines

BMP MAINTENANCE PLAN

Inspection, Maintenance Log, and Self Verification Forms
Operation and Maintenance Verification forms for the proposed treatment BMPs are included in this maintenance plan. All records of maintenance shall be kept in perpetuity.

Introduction
The Top of the Pines Development is an 18.97-acre development that will subdivide one lot into 4 lots and will include a new private access road, graded driveways, house pads, septic systems and water services from an existing onsite well. The site is located on top of a hill with rolling terrain, granite outcroppings and natural drainage channels. An existing 650-foot long paved access road crosses the northeast corner of the property and a gravel dirt road runs east to west across the property. No dwelling units exist on the site. Storm water runoff flows down in primarily two directions, to the north and east, with a small portion flowing to the west. Runoff to the east flows in a natural channel along the gravel access road to Pine Valley Road then crosses under the road in a 36" CMP culvert. Runoff to the north actually crosses the property line in numerous location but joins together immediately downstream. Both of these flows continue through the rural area and eventually join together and head southwest towards Barrett Lake.

The general climate in the hills of east San Diego County is seasonal with light snow fall in the winter and hot temperatures in the summer. The estimated annual rainfall for this area is between 15"-20". There are no dry weather flows though the site and no 303(d) impaired receiving water bodies downstream of the site. Two existing water wells will be utilized with this development project. The wells have been tested and evaluated and a copy of the report can be provided upon request. The soil classification for the area is Soil Group B.

The proposed project includes an access road and driveways that have been designed to minimum widths and to avoid disturbance of natural drainage flows. The road will follow the grades and provide bio-retention areas off the road where runoff will join the existing natural drainage channels. The bioretention areas have been designed to handle the volume of runoff flow from an 85th % storm event in accordance with the hydromodification BMP calculator. For the hydromodification calculator, the graded pads will include a 2,000 square foot home with driveway. All of the roads and driveways will be built at the narrowest width to minimize the disturbed and impervious surface areas. The volume of storm water runoff retained in bioretention areas will keep runoff rates from the entire site to predevelopment levels. Please see Attachment C, Drainage Management Areas Exhibit.

Responsibility for Maintenance
One PAC Company
2727 N. Central Avenue
Phoenix, CA 91935

(Thomas Fitzmaurice, RCE 55553 to oversee maintenance)

Agreement with FCCE will be provided.

Owner, One PAC Company, will provide funding for maintenance.
List of staff training programs will be provided.

Summary of Drainage Areas and Stormwater Facilities
Drawing with Sub basin to be provided for Construction

Sub-basin information table

SUB-BASIN	AREA (acre)	Runoff To IMP(cfs)	BMP/IMP	Velocity V (fps)	Outfall
West Basin	1.20	4.07	Bioretention	<2.0	Bioretention area overflow to rip-rap
North Basin	1.89	5.52	Bioretention	~10 to be determined	Bioretention area to asphalt spillway to D-40 energy dissipaters.
TOTP Lane Basin	0.41	1.26	Bioretention	<2.0	Bioretention area overflow to rip-rap
North East Basin	0.27	1.32	Bioretention	<2.0	Bioretention area overflow to rip-rap
Center Basin	0.20	0.65	Bioretention	<2.0	Bioretention area overflow to rip-rap.

Facility Documentation
Erosion control plan provided with construction drawings. "As-built" drawings to be added to this maintenance plan upon completion.

Maintenance Schedule or Matrix

BMP	INSPECTION FREQUENCY	ACTIVITY	COST
SD-10, Landscape Coverage	Monthly	Inspect landscape areas on graded pads and slopes for proper ground coverage and replant or cover exposed areas.	$400/yr
SD-12, Efficient Irrigation	Monthly	Inspect for over-irrigation, leaks, sediment buildup due to concentrated irrigation. See below. Immediately correct any problems. Adjust controls according to seasonal needs.	$1000/yr
SD-13, Outlet Protection	Annually	Inspect for displacement of rip-rap and broken rock and remove any sediment	400/yr

		buildup that will prevent dissipation of flow and reduction of runoff velocities.	
TC-32 Bioretention Areas	Monthly	Inspect for sediment and debris buildup that blocks flow over the landscape area.	2,000/yr

Total estimated maintenance cost is $3,800/yr.

A service agreement between the owner, One PAC Company and Fitzmaurice Consulting C.E. will be provided.

PRIVATE TREATMENT CONTROL BMP
OPERATION AND MAINTENANCE VERIFICATION FORM
INFILTRATION SYSTEM

1. Transcribe the following information from your notification letter and make corrections as necessary:

Permit No.: _____

BMP Location: _____

Responsible Party: _____

Phone Number: ( ) _____ ☐ *Check here for Phone Number Change*

Responsible Party Address: _____

Number Street Name & Suffix City/Zip

☐ *Check here for Address Change*

2. Using the Table below, please describe the inspections and maintenance activities that have been conducted during the last year, and date(s) maintenance was performed. Under "Results of Inspection," indicate whether maintenance was required based on each inspection, and if so, what type of maintenance. If maintenance was required, provide the date maintenance was conducted and description of the maintenance. Refer to the back of this sheet for information describing typical maintenance indicators and maintenance activities. If no maintenance was required based on the inspection results, state "no maintenance required."

Date of Inspection	Results of Inspection	Date Maintenance Completed and Description of Maintenance Conducted

3. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

4. Sign the bottom of the form and return to:

County of San Diego Watershed Protection Program
Treatment Control BMP Tracking
5201 Ruffin Road, Suite P, MS 0326
San Diego, CA 92123

Signature of Responsible Party **Print Name** **Date**

PRIVATE TREATMENT CONTROL BMP
OPERATION AND MAINTENANCE VERIFICATION FORM
INFILTRATION – SIDE 2

The following list of typical maintenance indicators and maintenance activities for infiltration BMPs is provided for your reference. There are many types of infiltration BMPs including basins that store storm water runoff in above-ground ponding areas until it infiltrates into the surrounding soils, and gravel-filled trenches or wells that store storm water runoff in the gravel reservoir until it infiltrates into the surrounding soils. This BMP category also includes permeable paving areas that store storm water runoff in a gravel reservoir under the permeable paving surface.

Infiltration BMPs Inspection and Maintenance Checklist	
Typical Maintenance Indicators	**Typical Maintenance Actions**
Accumulation of sediment, litter, or debris in infiltration basin, pre-treatment device, or on surface of porous pavement, as applicable	Remove and properly dispose of accumulated materials.
Standing water in infiltration basin	Remove and replace clogged surface soils.
Standing water in infiltration trench, dry well, or subsurface reservoir bed	Flush fine sediment from gravel storage area.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel.
Damage to permeable paving surface resulting in reduced storm water intake capacity	Repair or replace damaged surface as appropriate.

When inspection or maintenance indicates sediment is accumulating in an infiltration BMP, the watershed draining to the infiltration BMP should be examined to determine the source of the sediment, and corrective measures should be made as applicable to minimize the sediment supply.

ATTACHMENT G

Treatment Control BMP Certification for DPW Permitted Land Development Projects

County of San Diego

DEPARTMENT OF PUBLIC WORKS

Treatment Control BMP Certification for DPW Permitted Land Development Projects

Permit Number_____ SWMP #_____

Project Name

Location / Address _____

Responsible Party for Construction Phase

Developer's Name: _____

Address: _____

City _____ State _____ Zip_____

Email Address: _____

Phone Number: _____

Engineer of Work: _____

Engineer's Phone Number: _____

Responsible Party for Perpetual Maintenance

Owner's Name(s)*_____

Address: _____

City _____ State _____ Zip_____

Email Address: _____

Phone Number: _____

* Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information of president at time of project closeout.

Maintenance Agreement No.: _____

Percent Impervious Before Construction: %_____
Percent Impervious After Construction: %_____

Proposed Disturbed Area: _____Acres

Hydromodification Management:
Yes ☐ or No ☐

Primary or Secondary Pollutants of Concerns *(check all that apply)*

- ☐ Sediment
- ☐ Nutrients
- ☐ Organic Compounds
- ☐ Trash and Debris
- ☐ Oxygen Demanding Substances
- ☐ Oil and Grease
- ☐ Bacteria and Viruses
- ☐ Pesticides

Site Layout Strategies *(check all that apply)*

- ☐ Conserve Natural Areas
- ☐ Minimize Distubance to Natural Areas
- ☐ Minimize and Disconnect Imp.Surfaces
- ☐ Minimize Soil Compaction
- ☐ Minimize erosion from slopes

Disperse Runoff from Impervious Surfaces to Pervious *(check all that apply)*

- ☐ Use of pervious surfaces
- ☐ Street and Road Design
- ☐ Parking Lot Design
- ☐ Driveway, Sidewalk, Bikepath Design
- ☐ Building Design
- ☐ Landscape Design

Source BMPs *(check all that apply)*

- ☐ Storm Drain Inlets
- ☐ Interior Floor Drains
- ☐ Interior Parking Garages
- ☐ Indoor & Structural Pest Control
- ☐ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, etc.
- ☐ Food Service
- ☐ Refuse Areas
- ☐ Industrial Processes
- ☐ Outdoor Storage of Equipment and Materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/ Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☐ Fire Sprinkler Test Water
- ☐ Misc. drain or wash water
- ☐ Plazas, sidewalks, and parking lots

Treatment Control BMPs

BMP Identifier: (Identifier to match TCBMPs on TCBMP Table.)	Type	Record Plan Page for TCBMP	BMP Pollutant of Concern Efficiency (H,M,L)

(Add sheet for all additional BMPs)
The Maintenance Agreement has been recorded. Yes ☐ or No ☐

I certify that the above items for this project are in substantial conformance with the approved plans. Yes ☐ or No ☐

Please sign your name and seal. [SEAL]

Engineer's Print Name: _____

Engineer's Signed Name: _____

Date: _____

Submittals Required with Certification:

- Copy of the final approved SWMP.
- Copy of the approved record plan showing Stormwater TCBMP Table and the location of each verified as-built TCBMP.
- Copy of the specification sheets for the verified proprietary TCBMPs
- Recorded Maintenance Agreement (Category 1 or 2 only)
- Photograph(s) of TCBMP(s)

COUNTY - OFFICIAL USE ONLY:

For PDCI:
PDCI Inspector:_____

Date Project has/expects to close:_____

Date Certification received from EOW:_____

DPW Inspector concurs that every noted BMP on the plan and the SWMP or SWMP Addendum is installed onsite through field verification and completed as certified: Yes ☐
or No ☐

PDCI Inspector's Signed Name: _____ Date: _____

FOR WPP:
Date Received from PDCI:_____

WPP Submittal Reviewer:_____

WPP Reviewer concurs that the provided TC-BMP information is acceptable to enter into the TC-BMP Maintenance verification inventory. Yes ☐ or No ☐

WPP Reviewer's Signed Name: _____ Date:_____

ATTACHMENT H

HMP EXEMPTION DOCUMENTATION

ATTACHMENT I

Addendum